



# FANTASY



*The Magazine of Science Fiction*

No. 1



*The Rider Christmas Ghost Annual*  
**GHOSTS, GHOULS and GALLOWS**

★ *by C. F. MARSON*

A collection of original racy ghost stories that for sheer entertainment would be hard to beat. Some are based on fact, some are very good fiction indeed, all are uncommonly eerie and calculated to chill the spines of the hardest ghost fans. Ideal for the Christmas fireside.

*Order at once to avoid disappointment.*

9s. 6d. net. postage 4d.

★ ★ ★  
**BRIDGE OVER DARK GODS**

★ *by FURZE MORRISH*

Here something is achieved that many others have only attempted—a psychological novel of the esoteric life of Christ—a brilliant, strange, vivid, readable narrative.

"A plot full of action, clearly told, and quickly moving."—*Continental Daily Mail*.

9s. 6d. net. postage 4d.

★ ★ ★  
**Rider & Company**

68, Fleet Street, London, E.C.4

N. YORK : MELBOURNE : SYDNEY : CAPE TOWN

**ACTUAL  
 MAKERS  
 OF  
 ASTRONOMICAL  
 TELESCOPES**  
 COMPLETE INSTRUMENTS  
 FROM  
**£20**  
**BROADHURST, CLARKSON**  
 & CO., LTD. TELESCOPE HOUSE  
 63, FARRINGDON ROAD, LONDON, E.C.1.  
 (3 mins. from Farringdon Metro Rly. Station)

# THE SECRET OF MENTAL MAGIC

By **WILLIAM W. ATKINSON**

This contains full information about The Nature of Mental Force—The Two Mental Poles—The Law of Mental Induction—The Laws, Theory, and Practice of Mental Suggestion—Personal Influence—Personal Magnetism—Mental Magnetism—Positive Personality—Magnetic Attraction—Fascination—Mental Currents—The Circulation of Mind—Desire Force—Will Power—The Law of Mental Attraction—The Art of Visualisation—Thought Forms and their Materialization—Will Projection—Telementation—Telemental Influence—Mental Impression—Mental Concentration—Mental Centres—Mental Therapeutics Simplified—New Methods of Healing—Absent Treatments—Mental Architecture—Character Building—The New Discoveries of Brain Cell Culture—The Dominant Will—Individuality—and many other fascinating subjects. Full information, instruction, and exercises.

*Cloth, 6s. 6d. net, postage 4d.*

**L. N. FOWLER & CO., LTD., Dept. F,  
 29, LUDGATE HILL, LONDON, E.C.4.**

# Matters of Fact

By THE EDITOR

PERHAPS you've never seen a story magazine like this before. In which case, we should be interested to hear how *FANTASY* strikes you. On the other hand, you may be one of those to whom a magazine devoted to science fiction comes as an experience not quite unique, but rare enough to cause some jubilation. One of the many thousands whose interest in science and the influence of imagination on the shaping of things to come is reflected in their liking for stories which combine the two to make thought-provoking and entertaining reading. We know we shall hear from them . . .

If you've been looking for something *different* to read, something not only in tune with the times but well ahead of them, your search will have ended now that you've encountered this first issue of a magazine designed specially for you. If your taste has always been for the unusual, the unorthodox in fiction, and you've found it hard to satisfy, this is the magazine you've probably been waiting for.

Its function will be to interest all who are fascinated by what might—what *will* be, as well as what is or what has been, in the realm of scientific discovery and invention; whose curiosity goes beyond the bounds of everyday fact and whose mind is not appalled by the vistas of Space and Time. Above all, it will appeal to those who like to read fiction that is out-of-the-rut in conception and style, by writers whose capacities for intriguing story-telling are as limitless as their imaginations.

PRODUCTION of this new magazine has been not exactly a rush job. Plans for its publication were made many months ago, before it was generally realised that the Atomic Age had dawned. But, like many other post-war projects, it has been held up by difficulties of supply—in this case, of paper on which to print. It was originally intended that *FANTASY* should be made available to a far greater number of readers than will be able to secure this first issue, circulation of which is limited by the quantity of paper available for new publications.

We believe, none the less, that such a magazine is urgently needed now, if British science fiction is to be adequately represented

in a field which will see increasing development in the future. *FANTASY* has, therefore, been launched as a regular publication which will appear at more frequent intervals with the improvement of paper supplies. As soon as sufficient paper is available, it will be published every month.

Meantime, it is obvious that thousands of readers who would otherwise enjoy its contents are going to be disappointed, and that those who have been lucky enough to secure copies would do well to make sure of future issues by asking their newsagents to reserve them as they appear.

And remember—we shall welcome your comments on the stories and articles we present for you in *FANTASY*, whether or not they are entirely to your liking. We want to get your reactions.

MOST OF THE stories we shall publish in coming issues are the work of British writers, specially commissioned to make this magazine of absorbing interest to you. Many of these writers, like John Russell Fearn, Arthur C. Clarke, Eric Frank Russell and others we shall feature, are experts in this kind of fiction even if their names may not be too familiar to some of our readers.

Others will be newcomers to the science-fantasy field, but not to the art of story-writing; we expect a whole lot of new fascinating ideas from them. And a few will be new writers in every sense of the word. We shall always be on the look-out for fresh talent to assist us in developing this too long neglected field.

Norman Lazenby, a young Northerner to whom the early days of the war brought swift success after ten years of patient scribbling, is only one writer whose flair for really imaginative fiction we have been able to encourage for the benefit of *FANTASY*. His story, "A Matter of Size," in this issue, is the first of several he has done for us over which we believe all our readers will enthuse.

UNTIL NOW, the British author of magazine fiction has had very little incentive to write this kind of story for the enjoyment of his own countrymen. The fact that they

(Please turn to page 94)



# FANTASY

*The Magazine of Science Fiction*

VOL. I, NO. I.

DECEMBER, 1946

## CONTENTS

### *Novelette :*

- LAST CONFLICT - - by John Russell Fearn 4

### *Short Stories :*

- SUPERNOVA - - by P. E. Cleator 40  
THE WORLDS OF IF - by Stanley G. Weinbaum 46  
TECHNICAL ERROR - by Arthur C. Clarke 58  
THE PAIN MACHINE - - by L. V. Heald 70  
A MATTER OF SIZE - by Norman Lazenby 79

### *Articles :*

- THE MOON MEN - - by Walter Gillings 34  
LOST PLANET - - by Geoffrey Giles 56  
GOING DOWN - - by Thomas Sheridan 68

### *Features :*

- MATTERS OF FACT - - by The Editor 1  
THIS ATOMIC AGE - - - - 78

**WALTER GILLINGS, Editor**

The contents of this magazine are protected by copyright and must not be reproduced without permission of the publishers. All names, characters and incidents in stories are entirely fictitious. No responsibility is accepted for material submitted for publication, and return postage must be enclosed.

FANTASY, The Magazine of Science Fiction, published by Temple Bar Publishing Co., London, Ltd., 24, Store Street, London, W.C.1.



# Cosmic Adventurer

**SCIENCE-FANTASY**... A contradiction in terms, you say? One, a matter of delicate measurements and calculations, complicated research, formulæ, figures and facts. Above all, *facts*—things that can be demonstrated. The other, all misty dreams and flights of fancy, the wildest of fictions—the absurdly “impossible.”

Yet these two opposites are so closely related that they hyphenate almost naturally. The difference between them is only a matter of time. It may be hundreds, perhaps thousands, of years. More often, it's only a few. For however extravagant the fantasy it invariably turns out that it was, after all, an intelligent anticipation. In the end, the wizardry of science has transformed the once tenuous fancy into hard fact... and so another “impossibility” becomes a commonplace, to an accompaniment of “Well, I never! What *will* they do next?”

**PRACTICALLY** all the scientific marvels we take for granted today were present in the world of our ancestors—as fantasies. Crude, dim ideas they were, may be; so “impossible” that they were laughed at by those who could not credit what they would never see with their own eyes. Or, worse, were regarded as indicating their originators were in league with the devil.

Even while the ancient Greeks set the Earth at the centre of a crystal shell enclosing the stars and thus defined Creation, there were some who glimpsed the immensities of the outer universe, others who postulated theories on the atomic basis of matter. Centuries ago, the wonders of the motor-car, steamship and airplane were conceived in the imaginations of scientific dreamers as distinct possibilities of the future.

**HISTORY** is full of visionaries—and sceptics. Always the dreamer triumphs, even if he does not live to see his fancies materialise. Once the process was so slow that by the time his vision came to life the prophet's bones had crumbled to dust. More recently, the rapid strokes of the magic wand of advancing science have solidified the figments of fanciful minds in a succession of startling miracles, each prompting an excusable “I told you so” from some calculating seer.

The tank, the submarine, the flying fortress, radio, television... all these were prognosticated half a century ago by writers of the Verne-Wells school. Ten years before the war, careless of ridicule, experimenters in Europe and America were considering the potentialities of rockets for transport as well as for destruction. Jet-propulsion is another dream come true. The stratosphere liner and one-man helicopter; the new world of plastic cities, giant airports and television screens; atomic power plants and space vessels bound for the Moon—all these are yesterday's fantasies even now being transformed into tomorrow's facts.

**THE FUTURE**—even the distant future—isn't as dim and mysterious as we're inclined to think. Science-fantasy not only attempts to portray in fascinating story what might happen next, but to picture the whole course of things to come on this planet and beyond. It knows no bounds of space or time: its setting is the cosmos. And if some of its visions seem fantastic, we know better now than to call them impossible.

Beneath the impact of miraculous facts, impossibilities shrivel and die. Only dreams have a future.

THE EDITOR.



# Last Conflict

By JOHN RUSSELL FEARN

*To men of ruthless ambition, Science can be a very powerful ally.  
But too much power is dangerous for those who can't control it . . .*

TO THE uninitiated youth from Paradise Acres, London was a monstrous giant that awed and overwhelmed him, yet that fired within him a reckless desire to master its hugeness. He stood at the corner surveying it all, an untidy boy of seventeen whose clothes bespoke the neediness of his upbringing. Passers-by glanced at him curiously, but did not speak.

He had heard that the city was divided into two great circles, the inner one containing all the wealth and brains it possessed, the outer relegated to the Workers, the humdrum wage-earners with little ambition beyond their daily

bread. The tremendous advance of science and social welfare had laid their impress upon this new London of 1980, but in the process of the change had come a sharp cleavage between its citizens. Now, one was either very rich or very poor, very intelligent or very dense, the sole key to power being either exceptional ability or wealth.

Young Melvin Read, at the street corner, had very little money. But he was more than assured of his abilities.

"Looking for something, sonny?" a voice asked at his elbow. He glanced up at the burly figure of a city police officer.

"Yes," he nodded, entirely confident. "I'm looking for the Scientific Institute. I have an appointment there."

"That's the Institute down there." The constable pointed, then looked at the boy doubtfully. "You know, by rights I ought to detain you at the station while your circumstances are looked into."

Melvin frowned. "I don't understand."

"Which shows you don't belong to this city. Everybody here, Intellectual or Worker, knows the regulations."

"I'm from Paradise Acres," Melvin explained. "I came here first thing this morning, by monobus."

The officer reflected, as though uncertain where his duty lay. Paradise Acres was a garden suburb beyond the outskirts of the city proper, a backwater of the Workers, despised by its neighbours.

"Well?" asked the boy, challengingly. "Are you going to run me in or not?"

"No—but I should. Better be on your way before I change my mind." The officer's eyes twinkled.

Melvin nodded, murmured his thanks, and hurried through the crowds of shoppers and strollers in the afternoon sunshine. He was grateful for the shade of the Institute's great hall, and paused for a moment to get his bearings. At length he saw the door of the reception office. He opened it quietly, closed it carefully behind him, and found himself in a deserted, well-furnished room with a fan whirring softly in the ornate ceiling.

"State your business, please!"

He gave a start and cast a bewildered look round. On a screen set in the wall he saw the stern visage of a woman, and below the screen a loudspeaker.

"Name, please, and nature of business," the image insisted. "Speak plainly. The pick-ups will carry your voice."

Melvin cleared his throat. "I'm—I'm Melvin Read, from Paradise Acres. I've got an appointment with Mr. Colin Melbridge. He works here. He's a scientist."

"When was this appointment made?" the woman asked, acidly.

The boy hesitated before he replied. "Five years ago."

"Five years ago! Hmm—just as I thought! A cheap trick to try to gain admission to the Institute. Rebellious young men like you have tried it before, and I'm here to prevent it. For your information, Mr. Melbridge has been dead these two years as a result of a laboratory accident."

"Dead!" Melvin gasped. "But—but he can't be! I mean—Well, he told me to come here in five years' time and ask for him. I've witnesses to prove it—my brother Levison, and Lalia Melbridge. They were there when I asked Mr. Melbridge if I could get a job in the Institute and he told me to come and see him when I was seventeen."

The woman's expression softened a little. "You mean Miss Melbridge?"

"Yes, Mr. Melbridge's daughter. She was about thirteen then. . ."

The boy waited breathlessly as the receptionist considered. Then she said, tersely: "Your statement can be verified. Sit down, please."

THE SCREEN blanked and Melvin waited, anxious, but still hopeful. Presently an inner door opened and a slender, fair-haired girl in a white smock came in. He leapt to his feet, returning her stare. She hesitated a moment, then came forward with outstretched hand.

"Melvin Read! I couldn't believe it when they told me. I'm a student employee here. Do sit down."

She drew him on to a settee beside her, searched his serious, firm features with her clear blue eyes.

"I'm glad you remember me," he said, awkwardly. "I didn't get a very warm reception from the old battleaxe—"

"Miss Hart?" She laughed. "Oh, don't take any notice of her! But you—you came to look for Dad?"

"I've heard about him being killed, from Miss Hart. I'm sorry—for you, I mean, not because he can't help me. But I'm still in earnest, Miss Melbridge. I love scientific things, and I want a job in this city. I'm only a Worker's son, but—"

"Call me Lalia," she encouraged.

"Like you used to. You know, you really deserve a job here as reward for your patience and determination. I owe it to you, anyway, if I'm to keep Dad's promise. Just think how it all started when you and your brother saved me from drowning in that brook at Paradise Acres five years ago. I was trying to fish—remember?"

The boy nodded, his grey eyes reflective. "I've often wondered what your father must have thought of us and whether he remembered. He asked us what we wanted as a reward for saving you. Levison didn't want anything, and I asked for a job in the city when I grew up. Your father told me to come and see him in five years' time and to study some special science until then. And I've done that, Lalia."

"You have? What subject?"

"Electricity, the same as Levison. He wants to be a scientist too, only he hasn't the ambition that I have. He's got some idea about helping other people with his knowledge, no matter what it costs him. Silly, really—he'll never get anywhere. I want to help myself, to make enough money to stand on my own feet like my father did. He was clever; he would have been an Intellectual by now if—Oh, Levison's a fool!" he finished, irritably.

Lalia looked puzzled. "Rather strange to find twins with such different temperaments, isn't it? You are twins, aren't you?"

He nodded, sullenly. "We're identical in looks, but in nothing else," he assured her. He was silent for a moment, then went on urgently: "I need a job, Lalia—badly. Science is the only thing that interests me, and I need money to help Mother at home. Levison's started to make a little money, but one of us has got to make lots of it, and I'm the one. I've studied hard these past five years, hoping your father would keep his promise to me. He isn't here now, but if you could help me—"

She pondered. "Dad was a senior Chemist, and I'm only a student at the moment, with no influence whatever. All I can do is put your case before the Chief, Mernas Steele, and see if he can let you sit for an examination for the

Electrical Department. Dad was a great friend of his; he helped him in his early days. If I told him about Dad's promise—"

"You'd really do that?" The boy's eyes widened.

"You saved my life, didn't you? Come along with me," she said.

LALIA MELBRIDGE had taken a big risk on behalf of Melvin Read, and it was only later that he realised it. Had he not proved himself unusually promising when it came to the examination, the girl might have been discharged for allowing such a rank outsider to seek admission to the hallowed precincts of the city's Intellectual Circle. But as it happened, Melvin more than justified himself, and his untiring application to the post which automatically followed soon established him firmly.

Indeed, though she had inherited much of her father's ability, Lalia found it hard to keep pace with Melvin's brilliance. He began as a very ordinary electrician, remained so for a year; then his uncommon skill earned him the position of overseer of a small student section. From then on there was no stopping him. Spurred by the streak of ruthless ambition in his nature, in five years he had become third in importance in the Electrical Department; and in ten years, though still but twenty-seven, he was answerable only to the Chief Scientist for his decisions.

To Lalia, watching his meteoric progress with quiet interest, he was a man to admire. His general brusqueness she dismissed as the natural manner of a busy, astute thinker, and she accepted his orders without question. Pride, admiration, love—she experienced all these emotions in turn, and wondered if any feelings other than his passion for science and his driving ambition ever stirred beneath his hard exterior. Finally, she set herself to find out.

Melvin found her at the door of his home one summer evening, almost ten years to the day since he had entered the city as an immature youth. He lived on his own in a special residential quarter of the Intellectuals on the rim of the city's inner circle, which was carefully



separated from the outer ring of humble Workers' dwellings by a broad belt of green parkland segmented by great highways radiating like spokes from the towering central hub.

"Why, Lalia!" He was obviously surprised to see her at the door, her neat little runabout just outside the gate. "Come in—if you'll forgive the general untidiness. A bachelor home, you know. . . ."

"You need a wife," she smiled, as he took her coat. But he seemed not to notice the remark and motioned her to his study across the hall.

"Make yourself at home," he invited, reaching for a silver box. "Cigarette?"

His grey eyes met hers over the flame of the lighter. She asked: "You don't mind my coming here? Your neighbours may question the ethics, since this is the house of the Vice-Chief Electrician. It might start gossip, though I didn't think of it until I'd almost got here."

"Then it does no good to think of it now," he said briefly, as she sat down. "I'm sure you have a perfectly good reason for coming. As for the narrow minds and prattling tongues of my neighbours, one day they'll be proud of having lived within a mile of here."

Lalia only smiled. She was used to his egotism.

"I suppose," he went on, "you did come for some special reason?"

Her upturned gaze was steady as she replied, softly: "I came to see if you are the lonely man I think you are in private life."

"Lonely!" He gave her a keen look. "The busy man is never lonely, Lalia. I have plenty to occupy me."

She hesitated. "Don't you think I might share your interests—help you? I've a good scientific knowledge, have worked beside you for ten years. Doesn't it all count for something?"

He looked down at her pensively, then smiled tautly as he sat down beside her. "You sound like a woman in love!"

"All right, I am. You'd have seen that long ago if you hadn't been so wrapped up in your work. Not that I blame you; you've done very well. But surely you can afford to relax now

and again? There are other things—"

He shook his head impatiently. "I can't relax, Lalia, until I've achieved the objective I set myself as a boy—nothing less than absolute control of this city."

She was silent for a moment, her fair head bowed. Then, suddenly, she said: "You're aiming high, aren't you, trying to attain the Mastership? It will take you another twenty years. We won't be young any more then, Melvin."

"You believe in taking things into your own hands, don't you?" he remarked dryly. "Of course, I can see your point of view. Womanlike, you think our ten years of friendship and your help in the beginning give you the right to own me."

"Nothing so unpleasant," she objected quietly. "I am suggesting, since you seem too occupied to consider it yourself, that we get married. Why not? We have the same interests, the same ambitions, and you must know I would never have done so much for you if—I hadn't loved you from the start."

"Marriage," he answered slowly, "is an emotional distraction I can't afford at this moment. With a beautiful woman like you for my wife, I might lose my grip on essentials. But—"

SHE SAT WAITING for him to continue. For a while he seemed to be weighing something in his mind. Finally, he nodded in decision.

"There's no point in attaining my objective entirely alone. In fact, your help is just what I need at this stage. Let me show you something."

He moved to a wall safe and took out a roll of blueprints, laid them flat on his desk, and switched on the reading lamp so that the light fell across them. She rose and stood beside him.

"Something electrical?" she asked presently.

His grey eyes narrowed. "I believe this will give me the Mastership. The idea has absorbed my mind this past ten years. With this machine I can control the weather. Think what that means in a climate like ours."

"But that's wonderful!" Her admiring gaze was on him. "But," she added, dubiously, "Rufus Latimer

will never give up the Mastership. He's too popular, anyway."

"Popular!" His tone was contemptuous. "Popularity isn't power. He may have earned his position by his contribution to science, but he can't keep it for ever and he's had it long enough. I have here something greater than Latimer ever conceived. Once the Intellectuals know of it—and they will, very soon—they will have to depose him in my favour. If they don't—"

She almost recoiled from the glare he gave her, the fierce determination in his voice. He saw her startled look, recovered himself quickly, and said in even tones: "Produce something better than the Master and you become the Master. That's the rule, isn't it?"

Suddenly he seized her hands in his own, looked into her face in desperate earnest. "Listen, Lalia. Wouldn't it be better to build this machine before we turn to more personal matters. It's a great bargaining weapon, and Master and Mistress of London is better than plain Mr. and Mrs. Read, isn't it?"

She was smiling now. "Perhaps," she said. "Though I haven't got your all-consuming ambition, remember. Still, if you want it that way—"

"Good!" His smile was broader than she had seen it for many years. "You've solved something of a problem for me. I'd been wondering how I was going to get this machine built quickly and secretly, without assistance. I want the help of someone I can trust. If we work together at the Institute at night we can finish the machine in three months. Nobody can question what we're doing if I have authorised it—except Steele, of course, and I can satisfy him all right. And it really needs two people to construct a machine as intricate as this one."

"How does it work?" she asked, frowning over the blueprints.

"Quite simply, it will produce reactions in the atmospheric layers and vary the pressures normally controlled by wind action, thereby achieving climatic stability."

The girl's frown deepened. "You're not too generous with the details, are you?" she said. "In these plans—"

She stopped, and her brows lifted slightly. "But perhaps you don't want to tell me too much about it?"

He regarded her steadily as he rolled up the prints.

"I ask you to co-operate with me, Lalia, without my having to explain more than is necessary for your part in the actual construction. It isn't that I don't trust you, but what you don't know you cannot repeat, even in an unguarded moment."

She sighed and gave a little shrug. "You're a queer fellow, Melvin. But geniuses usually are, of course, so I must make allowances."

She turned away from the table, and for a fleeting moment the frown returned as a faint, half-formed suspicion crossed her mind. But she banished the thought as quickly as it came, turned to face him again.

"When do we start?" she asked.

THE BUILDING of the Elements Controller was a slow and arduous task for Lalia and Melvin, since the time they spent on it was always dependent on their freedom from official duties. But gradually, by unremitting devotion to their labours, they progressed.

The girl found her own part in the work limited to the assembly of various electrical components with which she was familiar, though their functions in Melvin's complicated apparatus she comprehended but dimly. The more intricate construction Melvin insisted on doing himself, usually when she was unable to be present. Noticing this, and his continued reluctance to discuss any but the most innocuous details with her, she more than once found herself considering if the Elements Controller was all it seemed to be, from what she had been able to grasp of its underlying principles. But each time she dismissed the suspicion as imaginary.

The summer passed as they went on working in a deserted wing of the great Institute, where Melvin had seen to it that no curious technician could pry without his knowledge and they could proceed without interference or interruption. Autumn came, and winter, and still they worked almost every night

under the shadowless glare of cold-light globes.

More and more, as they made headway, Melvin was consumed by an obvious impatience for the day when the machine would be complete. By the spring they had begun the final assembly of its several parts, and with the return of summer it was built—a great, glittering mass of crystalline bars, vacuum tubes, transformers and radial fans. In all it covered a hundred square feet of floor space and stood eight feet high, connected by numbered cables to a master switchboard.

"Finished at last!" Melvin breathed, as he completed his final inspection of its more delicate intricacies. "The hand that operates that switchboard will wield power greater than any amount of money can give. What do you say, Lalia?"

The girl appraised the massive machine critically as she stood aside, hands thrust in the pockets of her work-worn smock.

"You speak of power," she said. "I've noticed, though, that you don't seem to have made any provision for power with which to run this machine. You have meters on the switchboard going up to ten million volts, yet I see no sign of any contacts for power cables. Odd, isn't it? Or is the question out of order?"

Melvin smiled patronisingly. "I have taken that into account, believe me. I shall produce all the power I need myself, by a special process. When I make the first test tomorrow, you will see for yourself. Naturally, I don't want to excite suspicion by putting a sudden load on the city's power resources."

He paused, glanced at the electric clock. "There's time enough to have a little celebration over at my place, if you'd care?"

TWENTY MINUTES later they were settling down to a meal produced by the kitchen automat, when the doorbell buzzed. Melvin threw down his serviette, got up and went out into the hall. Lalia waited expectantly, heard the sound of voices that were curiously similar; then Melvin came back into

the room followed by a man who was the exact double of himself—except that he was smiling.

"Lalia, this is my brother Levison. You've met before, of course, but it's a long way back."

"So this is Lalia the woman!" Levison took her hand warmly. "Just as beautiful as I'd imagined from Melvin's letters. Well, I am glad to see you—it's been a long time."

"And I, too," she responded. "We've often talked about you, but you never seem to come to the city."

"Too much to do elsewhere. Besides, city life doesn't attract me—" He broke off. "I hope I haven't interrupted a little tete-a-tete?"

"As a matter of fact, you have," Melvin told him, "but you must stay and have supper with us and tell us what you've been doing."

"That's just what I came to see you about, Melvin," said Levison, as he sat down. "I felt I couldn't put it off any longer—I've been itching to tell you all along. You see, Lalia, I've lived out at Paradise Acres alone since Mother died, and I've nobody to talk to when I've something big to say."

"Well, we're listening," Melvin encouraged. "What's happened?"

"To put it briefly, I've found a way to amplify thought."

Melvin stared at him fixedly for a moment. "You've—what?"

"Thought I'd surprise you," Levison laughed. "I've done a lot of experimenting in the past few years, but it never amounted to much until now. So far, I've only got the idea worked out, but I know I'm on the right track. It goes deep into the science of vibrations—the sort of stuff you love, Melvin."

Melvin nodded slowly, a blank look on his face. His meal lay neglected before him. Levison went on talking in between his eating.

"I don't have to tell you that the brain gives off minute vibrations. The Harvard Institute of Science found that out long ago and even measured the length of a thought wave, which is about the same as ultra-short radio waves. Of recent years the British Telepathy Association have substantiated

the fact, and have proved that these tiny vibrations can pass from brain to brain if there exists what might be called a telepathic sympathy between them. The brain can both transmit and receive these minute impulses, but they are so weak that they are undetectable except in cases of deliberate telepathic transmission under the right conditions. For that reason we use speech or actions to convey our thoughts. The centre of thought remains sealed—nobody can really tell what another person is thinking."

"You mean you've broken the seal—made it possible for thoughts to be read?" Melvin asked eagerly.

"No, not that," Levison replied gravely. "I might be able to do even that, but personal thoughts were never intended to become public property. That kind of probing might wreck civilisation—"

"But, man, think of the power it would give anyone possessing such a secret! Power to read the minds of rulers, to divine your enemy's plans—" Melvin was passionately interested, now.

Levison sighed heavily. "Same old Melvin! If you conquered the universe, you still wouldn't be satisfied. This craving for power runs deep in your blood, doesn't it? If you don't—" He glanced at Lalia, checked himself: "But to get back to my invention."

"I set myself to find a way to amplify thought, to devise a machine capable of intensifying the normal thought impulses of the brain a hundred, a thousand, ten thousand times if need be. These amplified thoughts, if properly directed, might then overwhelm and influence the minds of every living being within an area depending only on the amount of power used."

"A kind of mass hypnosis?" Lalia suggested.

"You might call it that, but what I have in mind is rather different. The actual amplifying of thought does not present much difficulty, since it is identical with the principle of the amplification of radio impulses. The trouble was to find a way of intercepting and directing thought waves, which emanate from the brain in concentric

circles of gradually diminishing intensity, like the ripples from a stone thrown into a pond.

"The solution lies in an insulated helmet—and an insulator of the short waves of thought took some finding. But I managed it; and this helmet will prevent the thought waves radiating away in circles. Instead they are trapped and directed by an electro-magnetic beam in front of the helmet. This beam strikes directly on a magnetic plate, which in turn absorbs the vibrations and passes them on through a step-up transformer into the amplifier, whence they are radiated from the transmitting antenna with vastly increased power."

"Of course," he elaborated, "what I call the helmet is actually a big inverted dome and will be a permanent fixture of the apparatus. The operator will sit underneath it with the brain area of the head inside it. You understand?"

MELVIN NODDED, his brow lined with deep furrows, grey eyes fixed immovably on his brother's flushed face. Then, as though with an effort, he resumed his eating while Lalia watched him curiously. Suddenly he put the inevitable question:

"And what do you propose to do with this machine? You said you had some special use for it in mind."

Levison was silent for a moment. When he answered it was in a quiet, serious tone.

"I am going to try to destroy all the evil, disease and disharmony in the world."

With a start Melvin straightened up, laid down his knife and fork. His twisted features, as he stared at his brother, reflected a mixture of surprise, impatience and utter incredulity.

"But—but what a fantastic idea! Do you really mean what you're saying?"

"I do," Levison assured him without looking up.

"But such a thing isn't reasonable!" Melvin protested heatedly. "I don't doubt your ability to build this machine and use it to amplify thought as you say you can. But the object! Why get such sanctimonious ideas, when you have it in your power to control the world if

you go about it the right way? You could force millions of people to do as you wished! You've a glorious chance to attain a position of supreme power!"

Levison sat back in his chair and calmly returned his brother's glare.

"I am only too aware of the vast potentialities for good or evil that lie in such an instrument," he said deliberately. "And I hope I have a full sense of the responsibility it places in me to ensure that it is used only for good. I intend to work according to the scientific thesis that good or evil, illness or health, beauty or ugliness, are all conditions of thought as expressed through ourselves. Remember how Jeans put it in his *Mysterious Universe*? 'All that we see are thoughts expressed. The rest is remote inference.'"

With a gesture of annoyance, Melvin rose abruptly from the table. Ignoring Lalia's appealing look, he rapped out:

"Yes, yes, I grant you all that. But you could bend men to your will—for good, if you like. Think of the good you could do once you'd established yourself as top dog. Why, you could hold the world in the hollow of your hand!"

Levison laughed. "But I don't want the world. Only the chance to make things a little better. No man can hope to do more than that. Dictatorship brings its own downfall, and I'd do more harm than good that way."

"You two certainly are very different in your outlook," said Lalia, rising. "But you mustn't quarrel about it. Personally, I can see something in both points of view."

She took Melvin's hand in hers, drew him towards a soft settee, beckoned his brother to sit down beside her.

"Sorry," Levison apologised, "but I must go—lots of work still to do. I really came along to ask Mel to come over and see my designs for the apparatus. He may have some ideas for further improvements or spot some flaw I've overlooked. If you could come too, Lalia, I'm sure you'd be interested. How about tomorrow night?"

"I'd like to come very much. How about you, Mel?"

He seemed too immersed in his own

thoughts to reply for several seconds. Finally he nodded. "All right, Levison. We'll be along about eight."

"Good! Well, until tomorrow, then."

The girl took it upon herself to see him to the door. On the step he paused, turned to look down into her bright blue eyes.

"Tell me, Lalia, how do you two get along?"

She hesitated, averted her gaze for a moment, considering. "He's a little difficult at times," she admitted, a faint smile trembling on her lips. "If only he wasn't quite so ambitious. . ."

"I think he's already got as much as any man deserves," he said gently. "I'm sure he'll find that out, in time."

She watched him go on his way, closed the door slowly, and turned to see Melvin standing in the doorway of the dining room, a cynical smirk on his face.

"What a pity," he observed, "that such a brilliant mind should have such a strange kink."

THE NORMAL routine of the following day was so heavy for Melvin and Lalia that they had no opportunity to make a test of the Elements Controller. In the evening they drove out to Paradise Acres, where Melvin drew the car up at the gate of a little bungalow surrounded by trim flower beds.

Here on the verge of the unspoiled countryside, away from the endless throb of the city's heart, Lalia found an atmosphere of quiet contentment such as she scarcely knew existed, it was so long since she had been able to relax in such a setting. Though he tried not to reveal it, even Melvin seemed to find in the comfortable home an air of peace and well-being which to Levison was obviously the ideal state of existence.

After supper he led them out to a small but well-equipped workshop at the rear of the bungalow, where they inspected several pieces of apparatus in various stages of assembly, the purpose of which he explained to them. Melvin listened attentively, asking questions only when he seemed not to grasp some particular point he wanted to absorb,

and then very cautiously, almost apologetically.

At length, finding it difficult to convey an exact impression, Levison went to a drawer, took out a sheaf of small diagrams and spread them out on a workbench.

"Here, look them over carefully and see what you think of them. They explain the whole process from start to finish."

Melvin glanced at his brother strangely before he moved to the bench. He stood there for a moment, his back to the drawings, before he asked:

"Are you sure, Levison, that you're not being too trusting with your secrets? I want to help you, of course, but—"

Levison smiled, glanced through the skylight at the darkening summer sky, and switched on the light above the bench, flooding it with brilliance.

"What kind of man would I be if I couldn't trust my own brother?" he countered, quietly. Then, leaving Melvin to his inspection, he turned to occupy Lalia with further discussion of his experiments.

For some time Melvin pored over the drawings, examining each in turn. Finally he fixed his attention on one of them, and stood motionless above it for a full minute before he straightened up.

"Looks all right to me, Levison," he announced. "I can't see any reason why it shouldn't work out, though you can't tell for certain until you've made a more comprehensive test than you've been able to do so far. You say your experiments to date have confirmed all your theories?"

"Absolutely," Levison declared, gathering up the drawings and returning them to the drawer. "As I was saying last night, I believe that thought rather than mere matter is the true basis of our universe; that matter is the medium through which thought expresses itself. In the case of human beings and other organisms which we call living entities, the body is the medium. Whatever our mind wills the body must obey; and disease and all evil conditions and motives, if not the expression of our own thoughts, are due to the influence of other thought vibrations more

powerful than ours which are always present. I believe that my Amplifier, by enlarging the power of thoughts which will produce only the best possible conditions, will overcome those which result in undesirable states of being and exert a considerable influence for good."

There was the slightest suggestion of a sneer in Melvin's smile. "And if the operator willed otherwise?"

Levison waved the question impatiently aside as though it was not worthy of consideration.

"It will be some time before I complete the apparatus," he observed. "But I've made quite good progress in the last few months. Of course, I'll let you know how things turn out. Shall we go back into the house now? I'm sure Lalia's had enough of this."

THEY SAT AND talked of other things, recalling their childhood days, as they relaxed once more in the bungalow. Lalia had expected Melvin



to tell his brother of his own work on the Elements Controller which had been his ruling passion for so long, but he did not so much as hint at it. She marvelled at the contrasting characters of these twin brothers, one so ingenuously frank with his inmost thoughts, the other so cautious and secretive. But she found herself excusing Melvin his reticence on the score of his natural affection for his brother despite his lack of sympathy with Levinson's idealism. Perhaps he did not want to overshadow his yet uncertain researches with his own accomplishments.

At the same time she seemed to sense in Melvin's attitude towards his brother something which suggested an infinite respect for his attainments, and something almost of envy, as though what he had already achieved was worth more than the finished, if untested, product of his own devising. Though his assessment of its value was very different from Levison's.

He was silent as they drove homeward, gazing steadfastly ahead through the windscreen at the myriad lights of London spread out before them like an array of jewels. Full of her thoughts, Lalia lay back in her seat beside Melvin and did not attempt to draw him out. Not until they were engulfed in the city's effulgence, its floodlit buildings rearing up on either side of them, did he reveal his feelings. They were much as she suspected.

"Brother Levison seems to have something in that Thought Amplifier of his. If only he weren't such a fool as to think he can reform the world by gentle persuasion! What it wants is force. Think what a power such an instrument would be in the hands of one man—one master!"

"You, for instance?" She could not resist the sally.

He shot a quick glance at her but did not reply. He said no more until he took his leave of her when they drew up at her flat in the centre of the city, and then it was only a perfunctory "Goodnight. See you tomorrow." Almost before she had closed the car door he was on his way again.

As soon as he arrived at his own home

he went down to his private laboratory in the basement, and removed the jewelled collar-pin he had been wearing all the evening. Switching on a red lamp, he laid the pin carefully down on a bench, produced a delicate instrument from his pocket, and with it unscrewed the massive diamond from its gold setting. It was evident now that this was no ordinary jewel, or even an ordinary imitation. The centremost, biggest facet was, in fact, a finely graded minimising lens with a minute iris-diaphragm behind it, actuated by the pressure of light-wave photons. The flood of radiance above the bench in Levison's workshop, when he had turned towards it, had been just what he required to make the shutter open and close two hundred times faster than a blinking eyelid. And his brother had switched it on for him, leaving him only to take up a position which would ensure a correct focussing of the tiny camera upon the drawings spread out on the bench. Just in case there were a few details he could not memorise exactly. . .

Smiling to himself, he fished inside the hollow setting of the jewel with his slender tweezers, extracting a microscopic strip of film. To develop and enlarge the image was the work of a few minutes. Switching on the normal lighting, he examined the perfect copy of Levison's designs which it presented.

"Yes, my misguided brother," he mused, aloud. "You can trust me—to see that your patient efforts are not wasted as *you* would waste them. If you don't want the world, I can use it!"

IT WAS ANOTHER three days before Melvin found himself free to undertake the first test of the Elements Controller. At seven o'clock, answering his call over the visiphone, Lalia presented herself in his office. She found him in the act of donning a heavily-protected suit equipped with a dark-goggled helmet and lead-soled boots. She regarded him quizzically.

"Heavens, Mel! What's all this for?"

"Simply taking precautions," he told her. "It's likely there may be some pretty powerful radiations from that

machine, and I want to be sure I don't get hurt until I know for certain what they are. They may be quite harmless, but—"

"Radiation? But why should there be? I don't understand. You've never mentioned anything of the sort before."

"We're playing with elemental forces, Lalia, and no precaution can be too great. But there's no need to fuss; everything will be all right. I just don't want to leave anything to chance, that's all. Since I haven't got another suit like this you won't be able to come in the lab with me, but you can watch through the glass panel in the door."

She shrugged her slim shoulders, followed him along the corridor to the laboratory. He unlocked the door and went inside. She heard the click of the lock and stood watching him through the thick glass. She saw him fasten the helmet over his head, draw on the huge gloves. Then he crossed to the switchboard, threw in the master switch.

The dynamos began to hum, stepping up swiftly to a steady, high-pitched whine. From her position outside the door Lalia could not see the meter readings, but the delicate needles were visible, jumping along their graduated scales. There was power there—vast power such as she had never expected; and soon she saw the manifestation of it as the normal lighting of the laboratory began to dim before the flashing lightnings of the machine's own creation. From the two anode and cathode globes at either end darted livid membranes of high-voltage electricity. Then, as the power mounted still further, they became violet-tinted chains leaping from globe to globe with crackling impact, hurling their energies into the transformers.

Lalia stood awed by the sight while Melvin, looking like some grotesque demon, worked over the switchboard, adjusting potentiometers and studying dials. Gradually, out of this wild chaos of unleashed forces was born a pale, lavender beam which rose from the centre of the machine, growing in strength and colour until it appeared like a massive amethyst column supporting the roof. Amid the flashes

of his surging power Melvin stood watching it, supreme exultancy in his attitude; while the girl could only stare, shielding her eyes against the incessant bursts of glaring light which gushed from the potential globes.

Minutes passed with that strange, transparent beam stabbing upwards to the roof of the laboratory, which, she assured herself, formed not the slightest barrier to its matter-penetrating substance. Though how high it reached she could only wonder, until a sudden draught from the ventilator shafts came sweeping along the polished corridor, bringing her to the realisation that other things were happening outside. The big windows close to where she stood had lost their summer evening brightness and become dark rectangles of gloomy grey. With every second the external scene was changing.

Then, turning back to the glass panel, she caught her breath as she saw Melvin straighten up from the switchboard, pass a gloved hand slowly across his dark goggles, stagger slightly and fall headlong to the floor.

"Melvin!" she screamed, beating frantically on the door with her fists, though she knew there was little chance of his hearing her even if he were conscious. He lay there unmoving while she watched in growing panic. He had locked the door behind him. Had he thought this might happen? But to deny himself her aid— She could only stand there, bewildered, trying desperately to think.

STARTLINGLY, from outside came a vivid flash of lightning that lit up the corridor, followed almost immediately by the violent crash of thunder. The draught was sweeping along the passage now in chilly gusts. There were splashes of rain on the windows—

In sudden decision she swung round, raced down the corridor to Melvin's office. She paused in the doorway for a moment as a terrific flash of lightning dazzled her. Then she dived for the desk, whipped up a heavy paperweight and dashed back to the laboratory.

One—twice—three times she struck at the glass panel before it went sharding



inwards. Hot, foul air wafted full in her face and set her coughing for a moment; then she thrust her arm through the opening, reached down until she could just touch, and turn, the key. As the door opened she hesitated, appalled at the crackling electrical hell before her. But the greater fear of what would happen if the machine was not stopped and Melvin rescued drove her forward, straight towards the master switch.

She seized the massive handle, tore the great blades out of contact. Instantly the lavender column vanished, the livid lightnings from the great globes ceased, meter needles flicked back to zero. Sickened with the smell of ozone, her head swimming in the stifling heat, she grasped the belt round Melvin's waist with both her hands and dragged him across the floor towards the door. The cool air sweeping along the corridor soon revived her, gave her added strength. Struggling with the dead weight of Melvin's limp form, she managed to reach the nearest window. Flinging it open, she saw with relief that the rain and the wind had almost stopped, the clouds already dispersing.

Quickly she unscrewed the heavy helmet and pushed it back over Melvin's head, revealing his deathly pale face, drenched with perspiration. His eyes were closed; he was still breathing, but shallowly, like one in a coma. A sudden fear clutched at her heart. Leaving him, she hurried back to his office and called the Medical Department, where there was always someone on duty. In a few minutes a doctor came, followed by two attendants with a stretcher.

The doctor made a brief examination, then Melvin was lifted on to the stretcher and carried away down the corridor.

"Is—is it serious?" Lalia asked anxiously.

"No—but it might have been. Exposure to some kind of radiation, I fancy. At the same time, something went wrong with the air supply in his suit. What was it—some sort of experiment?"

She nodded. "I was watching outside—he said it might be dangerous. I saw him fall, so I went in and dragged him

out into the corridor. I had to smash the door panel to do it."

The doctor glanced towards the open door of the laboratory. "I see. You scientists take too many risks. Better come along yourself—you've had a nasty shock. Lucky you didn't get burned. . . ."

Too weak to argue, she went with him to the hospital bay where a nurse ministered to her. She had just drained a glass of sparkling restorative when the doctor returned from examining Melvin.

"He had better stay with us for a day or two," he told her. "He has recovered consciousness—"

"Can I see him?"

"Not for the moment, Miss Melbridge. He needs perfect quiet for the next few hours. He tells me you are his assistant in his research work. You'd better take these things of his—keys, identitygraph, and so on. You may need the keys, since he will be absent for a while."

Lalia nodded, signed for the belongings and put them in the pocket of her smock. Slowly she made her way back towards the laboratory, her thoughts curiously muddled. Things had not gone at all as she had expected. There was something about Melvin's machine that mystified her more than ever—and about its creator. Did he intend that it should produce the effects it seemed to have done? Was he even more aware than he pretended of the devastating forces he sought to control, and which had only recoiled upon him in spite of his precautions? Why had he concealed so much from her? Was it to allay her fears for his safety, or—?

Suddenly she remembered that the laboratory door had been left unlocked. Whatever his motives, she had vowed to keep his secret. It was unlikely that anybody remained in that part of the building at this hour, but if some unsuspected prowler had been waiting the opportunity— She quickened her pace until she reached the corridor where the door stood open, to find that her fears were groundless. All was deserted as before.

She stood for a time in the doorway,

gazing meditatively at the great machine. But at last, thrusting her doubts aside, she turned to lower the steel shutter over the broken glass panel of the door, which Melvin had always kept in position to prevent even a glimpse of the machine from outside. She was just about to leave when she caught sight of a switch and wiring diagram which Melvin had brought with him from his office lying on a bench near the control board. She folded it and took it with her, locking the door as she left.

Returning to the office, she went to the safe and, after trying several keys, opened it and put the diagram inside. She had almost closed the heavy door when an inscription on the back of a rolled sheet of cartridge paper caught her eye. It was in Melvin's bold handwriting:

*Thought Amplifier.*

She stared, unbelieving. Surely Levison had not given him any of his designs? Then how had Melvin come by this one, if such it was? Unable to resist the temptation, she took out the roll of paper, slipped off the rubber band. The merest glance at the sheet, as she opened it out, was enough to assure her. It was undoubtedly a photostatic copy of the diagrams Levison had spread out on the bench in his workshop for his brother to inspect. They were all there. One or two of them were not very clear towards the bottom of the sheet, but on the whole the details were perfect, though the photographs seemed to have been taken at an angle which prevented a proper focus.

The conclusion was obvious—and unpleasant. As she rolled up the paper and replaced it in the safe, Lalia's face reflected the uneasy thoughts which, this time, she could not banish. She stood there staring with unseeing eyes in which were only regret and misgiving. Then, with a sudden effort, she turned and ran from the office.

TWO DAYS LATER, Melvin was back at his desk. His curt summons for her to come to his office was the first intimation Lalia had of the fact. He looked up as she entered, his face expressionless.

"I believe Dr. Martin handed over to you several of my belongings, including my keys," he said shortly. "I would like them. It is a little—er—embarrassing having to rely on the commissionaire to let me into my own office."

She put the things on the desk. "I would have given them to you if I had known you were back," she remarked. "I called to see you, but they said—"

"I told them to tell you I was all right. I thought it better that we should not appear on too intimate terms. After all, you are one of my staff. Still, I'm none the less grateful for the way you rescued me. Undoubtedly, you saved my life."

She smiled faintly. "Something went wrong—"

"It was only my suit. You saw yourself how successful the test was. That's why I wanted you outside. I heard about it later, of course."

"You mean—the storm?"

"Precisely. I set out to produce those conditions through the machine. I succeeded—perhaps almost too well, after the suit went wrong and I lost control. A good job you had the sense to stop the machine—and to make things secure afterwards. However, we can take no more risks. I have decided to dismantle the machine and move it to my private laboratory, right away from the Institute. We shall then be sure of perfect secrecy until we are ready to come out openly with a demonstration for the Master's benefit."

He paused as though waiting for her to say something, but she remained silent. He flashed a quick glance at her.

"You're sure that nobody saw into that laboratory? Dr. Martin, for instance?"

"Nobody. I locked up myself, and put the diagram you had out back in your safe."

She thought she saw a startled look pass swiftly across his features before he glared at her in sudden annoyance.

"You had no right to go to my safe, Lalia, even if Dr. Martin thought you were entitled to hold my keys! The diagram would have been quite secure where it was. Must I have you prying

into all my secrets when my back is turned?"

She regarded him intently, ignoring the insult. He seemed uncomfortable beneath her cool, searching gaze. His indignation passed as quickly as it had come.

"I'm sorry, I shouldn't have said that. I have too much to thank you for. But, really, I don't like you taking such liberties, even if you are in my confidence."

She smiled, though her blue eyes were sad. "I understand," she murmured softly. "Now may I go back to my work?"

Long after she had gone he sat staring after her, drumming nervous fingers on the desk-top. Finally he got up and went to the safe.

WITHIN A FORTNIGHT the Elements Controller had been installed in Melvin's own laboratory, having been removed in sections and reassembled with Lalia's assistance. The underground compartment had been slightly enlarged to receive it, and the walls and ceiling so thickly reinforced by the workmen Melvin had engaged that Lalia was prompted to question the necessity for this added construction.

"Just to protect the machine, that's all," he told her in that casual manner with which he dismissed all her questions. "By the way," he went on, "I've seen the Master about a demonstration. He wants to see what we can do—to-night. I've promised to produce rain, hail, thunder, snow, and then a fine sunny evening, in that order."

"Indeed?" She tried to conceal her surprise. He had obviously left it to the last minute before he took her into his confidence. They were just completing the final stage of the machine's assembly.

He strolled to a corner cabinet, opened it to disclose two protective suits like the one he had worn the first time he tested the machine.

"You will be able to watch from inside this time. There will be no danger. I have seen to that."

He moved to the opposite wall, switched on the television periscope

which gave them visual contact with the surface. As he swept the light-photon magnetiser around at the turn of a dial, the whole landscape became visible in a panorama of distant green fields dotted with little dwellings, with part of the more densely packed outer ring of London looming in the foreground. At length they saw the great towered bulk of the city's centre rearing solid against the evening sky. The scanner turned full circle, and once more the screen showed a vista of peaceful fields and hollows huddling into the distance beyond the fringe of the city.

"We'll see if we can change all that," Melvin said, with one of his rare smiles.

Yet to Lalia, as she gazed in fascination at the screen, there was a lurking menace in his voice. She felt a little thrill of apprehension, if not actual fear, and glanced nervously about the laboratory, almost certain now that all was not as it should be. That great, shining machine which held the key to the mastery of the elements, and to much more than that for the cold, ruthless genius who had conceived its deadly power—it seemed to her a thing of latent evil, a grinning monster which had ensnared them both in its lair. And Melvin, the boy grown from ragged obscurity to the man she loved for his dogged perseverance and masterful nature, even if at times she doubted his motives; the man she had helped in his struggle, yet who regarded her as he might regard a piece of machinery— Here, deep beneath the surface, alone with him and his deadly powers, she was afraid—not of him but of those powers he strove to control. She was afraid as much for him as for herself; perhaps a great deal more. . . .

He seemed almost to sense her mood and tried to console her, not with comforting words or caresses, which were of no concern to him, but with the promise of rewards which were his only criterion of value.

"You remember, Lalia, that when a little while ago we discussed the question of marriage I told you it would be better for us to wait until we had built this machine? But I said I would make you Mistress of Britain beside me once

I had the power I had set out to get—to share that power with you in return for your help. If I succeed tonight in demonstrating that power—and I shall—you can hold me to that promise just as soon as you wish.”

She forced herself to smile, to murmur her thanks, though she felt no enthusiasm at the prospect which had attracted her a year ago. She remained silent, staring into the screen and trying to stifle the qualms which tormented her, those fears which she had to convince herself were pure imagination. Until at length Melvin went to the cabinet and lugged out the two suits, began to clamber into one of them.

“It’s nearly time,” he told her. “Come on, get into this. These suits are equipped with audiphones, so we can talk to each other.”

Mastering her uneasiness, Lalia obeyed. They checked their air supply carefully, then dropped the helmets in position. Melvin lumbered to the control board, threw in the main switch. The dynamos began to hum, meter needles jumped, and as he pulled another switch there was a sudden violent crackle of released energy and brilliant electric membranes leapt the gap between the globes.

From behind her tinted goggles, Lalia watched the mounting violence of that interchange of titanic energies. Even through her thick suit she felt the wafts of disturbed, heated air which eddied about her. But her timid fears were gone now. The deliberate efficiency with which Melvin operated the switch-board, as though to demonstrate to her his absolute mastery over the machine, reassured her completely, leaving her in rapt admiration of his superb confidence.

“Now!” he cried, and closed the big plunger switch connected with the distributor plant, into which the sizzling bolts of electric power had been hurling their terrific voltages. In a few seconds more the lavender beam came dimly into view, ascending to the concrete roof, and gradually deepening in colour and solidity. Enthralled, Lalia stood staring at it while Melvin waited, keeping careful watch on his meters. Eventually

he looked up, and brought her out of her trance with a gesture towards the televisior behind her.

LIFTING HER goggles, she turned to look at the screen, to find the view strangely dimmed. Fifteen minutes before, it had been bright and sunny outside. Now it was dull and gloomy, the landscape barely discernible, overhung by thick black clouds. She turned the view control slowly, and the all-seeing eye traversed the surrounding vistas. Everywhere, in and outside the city, it was the same. Not a single ray of evening sun penetrated those darkly ominous masses of thundercloud floating above.

Again she felt that brooding fear and turned to find Melvin gazing over her shoulder at the screen, his helmet pushed back over his head, eyes half-closed in a leer of smug satisfaction. Behind him that stabbing beam of lavender light was steady, unwavering.

“The—the storm!” she said uncertainly.

He nodded slowly, confidently. “It won’t break yet,” he assured her. “Meanwhile, perhaps I can satisfy your curiosity as to how this machine works. You know that the Sun is constantly throwing off streams of electrons which enter the Earth’s atmosphere and, under certain conditions, bring about electric storms. When an area of the atmosphere becomes impregnated with them a positive electric field is built up, which finally discharges to earth.

“In just the same way, I can produce such storms with this machine by capturing and storing up those streams of electrons from the Sun and releasing them at will. This store of potential energy is the source of the vast power I use, of which I told you. When I have a potential of twenty billion solar volts the energy is released from the storage globes and passed into the converters, thence to the distributor plant. It manifests itself in that violet beam and passes through to the outside just as easily as radio waves pass through solid substance. It reaches into the atmosphere, and there forms an intense

positive field extending over a large area. Hence the dense thunderclouds produced by the change in atmospheric conditions. Eventually the charge breaks down, and we get our storm."

Lalia's doubts were not relieved by the knowledge of the machine's functioning. In fact, she was all the more certain that its purpose was merely to destroy.

"And what about the other conditions?" she ventured. "Or are you only interested in storms?"

He permitted himself a smile which was almost genuine. "At the moment, yes." Then his face hardened, his grey eyes grew cold, and his gloved hands clenched in grim determination. "I am going to produce a storm of such violence as has never been known in all history—a storm that will lay London, and all around it for a hundred miles, in the dust!"

Lalia's gnawing anxieties crystallised at last into a chilling panic which stopped her breath and clutched agonisingly at her heart. For an eternity she could only stand there staring, sick with horror, while she strove to find words with which to reply once she had recovered her power of speech.

"You—you don't mean—" Her tongue was still incapable of conveying her chaotic thoughts. Her lips trembled in sympathy with her shaking fingers. Melvin watched her stonily. There was deadly venom in his voice as he went on relentlessly.

"I mean that I am going to take my revenge on this proud city before I take its destinies into my hands. It needs a lesson—badly. When first I tried to gain a foothold in it, it despised me because of my lowly origin. I knew the ultimate power I sought, the Mastership of the city, would never be mine through ability alone. All through the years I have been constantly reminded that I was not born into the Intellectual Circle. So, to overcome that handicap, I produced this."

He waved a gloved hand towards the machine. There was a wild exultancy in his manner now, and his voice rose to a higher pitch. To Lalia, as she stood there transfixed, it sounded almost a shriek.

LAST CONFLICT



"A destroyer—that's what it is, a destroyer of prejudices! And yet a creator—the builder of a new order of things. When I am Master, the city will see many changes. There will be plenty for us to do, Lalia!"

"You—you seem very sure—that you *will* be Master." The girl found the words a terrible effort. "If you're—found out—"

He laughed, hideously. "Oh, I've taken care of that! Rufus Latimer is in his office tonight—on the top floor of the highest building in the city. This storm will have no respect for tall buildings or for men of high office. It will be ruthless, devastating! In another ten minutes—"

Suddenly, to Lalia, this man she had cared for and encouraged stood revealed as a dangerous fiend armed with a dreadful weapon; a warped genius, drunk with ambition, who would stop at nothing to achieve his selfish ends. The realisation brought her back to her senses, filled her with bitter anger which flowed through her veins in a flood of furious energy. Seized by a desperate impulse, she wheeled, snatched up a light steel chair and flung it with

all her strength at the posturing figure of Melvin.

He sensed her intention, but too late to do more than jerk his head aside. One of the tubular legs of the chair caught him full in the face, striking his forehead before it crashed to the floor. He raised a hand to his eyes, gave a little moan, swayed and crumpled up over the switchboard.

LALIA DID NOT wait to see the result of her sudden burst of violence. She was obsessed by one thought—to escape from this crackling, stinking, blinding machine and the madman who had created it. As soon as she had flung the chair she turned to the door, pulled back the heavy bolts, swung it open and fled down the passage towards the steps which led up into the rear of the house. There she stopped only long enough to throw off her protective suit and snatch up her hat and coat. Then she ran to the front door and out into the roadway to her car parked on the side.

Gasping for breath, heart thumping wildly, she scrambled into it and drove off, snapping on the headlights as she pressed her foot hard on the accelerator. Though it was still early evening, the darkness was now almost as black as night itself; the rows of houses on either side were dotted lines of light, the road a shining ribbon of floodlit plastic stretching out ahead of her. The still air was warm and clammy; she was grateful for the gentle draught which came through the lowered windows as the car gathered speed. A deathly silence, broken only by the soft purr of the wheels on the roadway, seemed to overhang the darkened world as though with a threat.

Now that she had escaped, she scarcely knew what to do or even where to go. She began to wonder if she should not go back to turn off the machine before it could do the damage Melvin intended. But she had not injured him seriously; he had probably recovered by now and would certainly prevent her interfering with his plans. In any case, the storm would break in a few minutes if what he had said was true. There was nothing

she could do except try to save herself in the short time that remained.

If she tried to warn the people, who would heed her? And what could they do but await the storm they were already anticipating, without any suspicion of its unnatural origin, its catastrophic menace? Except, perhaps, Rufus Latimer. But by the time she reached the heart of London— She could only clutch at the hope that Melvin was exaggerating the potential violence of the storm. And yet. . .

Levison Read! The thought came to her as she realised that she was approaching a junction where the road to Paradise Acres led off on her left. She would go to him—he would understand. She would tell him the whole story of his brother's treachery, of her own foolish encouragement of his crazy lust for power. And if she could only get there in time she might be able to warn him, to save him from the storm.

She drove madly until she reached the crossroads, turned and urged the car on at full speed. The road was clear, stretching out in a straight line of light towards the open country beyond the city's limits. The miles vanished beneath her racing wheels, until at last she topped the rise overlooking the little collection of bungalows lying in a green hollow. Then, abruptly, the storm broke.

A brilliant flash of lightning snaked across the black sky, piercing the gloom with a blinding intensity. Almost immediately a shattering crash of thunder shook the earth beneath with its terrific concussion. Dazzled, Lalia clung to the steering wheel as the car dropped swiftly down the slope. The lightning came again, stabbing down from two directions in a shower of purple strands upon the road ahead. Even as she recoiled from the impact of the flash the thunder beat at her eardrums, making her wince with pain; nor had she recovered from the shock of it before the road directly in front of her was again drenched with violet flame and the thunder rolled over her with mounting fury.

Another vivid flash forced her to lower her eyes from the windscreen for a fleeting instant. She raised them just in time to see a giant elm tree at one

side of the road, fifty yards ahead, split itself in half and come toppling down across her path. She jammed on the brakes, came to a stop within two yards of its spreading branches which completely blocked the roadway. She clambered out of the car and stumbled forward through a lilac-tinted haze, reached the fallen tree as another blinding flash high above her was followed by a swishing roar as of a deadly projectile descending from the tortured skies. Startled, she looked up to see a ball of blazing brilliance fall into a distant meadow.

IN THE STEADY glare of the headlights and the ceaseless lightnings which dimmed them to pallid beams of yellow, she clawed her way between the branches of the fallen tree. While the thunder crashed on either side in a constant cannonade she paused uncertain on the road beyond, peering into the intermittent gloom. Down there in the valley, dimly visible between the purple flashes, she could pick out the lights of houses in Paradise Acres. She still had the best part of a mile to go before she reached Levison Read's bungalow. A mile of terror, with lightning-swift death striking down at her every second.

She hesitated only a moment before she made up her mind. With sudden resolve, she made for the grass bank at the roadside, crawled between the wires of the fence and started to walk across the field in the direction of the huddling houses. She had hardly taken half a dozen paces when the rain came, falling in huge drops which soon became a solid downpour, drenching her until her light overcoat was soaked, striking at her face and leaving her gasping, battling against its violence.

Then came the wind, sweeping across the field like a tornado, blowing her first to one side, then the other, and at times urging her forward as though in sympathy with her desperate desire for shelter. As she struggled on purposefully the storm seemed only to increase its fury, the lightning descending in a brilliant cascade of violet that enveloped her in a flood of dazzling light which was at one with the torrential rain.

Then, through the flaming curtain which hemmed her in, a sudden, streaking flash struck at her like a sword. She staggered, screamed at the shock of the concussion, and fell headlong in the sodden grass.

For several minutes she lay there paralysed, her whole body tingling, eyes staring helplessly at the sky, which presented a picture of awe-inspiring grandeur. Chain lightning rippled in an unholy filigree against a purple background, while here and there great, humped masses of jet-black cloud seemed to dilate and quiver as pent-up energies strained for outlet. When at length the numbness had gone out of her limbs, she got to her feet, stood for a moment gazing towards London. A red glow hung over the city, visible even through the watery haze, while forks of savage brightness stabbed down into it ever and again with merciless insistence.

Set-faced, her heart pounding, she turned and went forward again. How she covered the remaining distance she hardly knew, but when at last the yellow oblongs of light loomed large before her she was filled with a deadly weariness, her head swimming from the incessant tumult of the storm, her eyes smarting from the wind and rain. She halted, breathless, a terrible ache in her side. Then on again, until she half slid, half fell down a muddy, slippery bank to the flooded main road which ran through Paradise Acres.

Up to her knees in surging water, she struggled across towards the road which led to her destination, less than a quarter of a mile away. Again she was forced to stop while she regained sufficient energy to continue, clinging to the railings of a tiny house whose shattered roof testified to the damaging power of the storm. More than once, as she hurried on, she passed a house that had been reduced by a stroke of that incredibly vicious lightning to a heap of smouldering rubble. She breathed a prayer of infinite relief when at last she came to the little bungalow which was her final objective, to find it stood unharmed, its unshaded windows shining like welcoming beacons.

Thankfully she leaned for a second against the gate, then flung it open and ran up the path to the front door as another of those terrible lightning forks cleaved the sky above her. The ear-splitting burst of thunder was an overwhelming accompaniment to her frantic pounding on the door, which she continued as long as she had the strength. Then suddenly an awful weakness overcame her, she sagged helplessly against the door and collapsed in a heap on the step.

WHEN SHE CAME to her senses there was the sharp flavour of restorative in her mouth. The dinning chorus of thunder, howling wind and swishing rain still assailed her ears but seemed a little more remote, and the bright light around her shone steady and clear instead of in blinding bursts of violet. Gradually she became aware that she was lying comfortably on a low couch, at the foot of which a man stood smiling down at her.

"Levison!" She struggled up. "I thought I'd never get here—"

He pushed her gently back on her pillow, leaned over to make himself heard above the tumult outside.

"Take it easy for now. You've had a pretty rough journey. My housekeeper, Mrs. Dawson, fixed you up and took off your wet things. Just now she's in the kitchen getting some tea."

Lalia glanced down at the warm blankets that covered her. "I'm very grateful. I was about all in. I think I fainted."

She buried her head in the pillow as a tremendous crack of thunder shook the house to its foundations, and opened her eyes to find Levison regarding her coolly as he filled his pipe. She almost screamed at him:

"Don't you realise this place may be struck at any moment? I've passed several smashed houses—and London is in flames. If this terrible storm goes on through the night—"

She paused as the elderly Mrs. Dawson came in with tea on a tray. She smiled at Lalia, set down the tray, and went out again with apparent unconcern. Levison passed the cup to her.

"Now, just drink this and go to sleep—if you can. We can talk later."

She was too exhausted to protest. Though the storm still raged, there was something about the calm assurance of Levison Read that gave her a sense of security, dissolving her useless fears. She returned the cup, sank back again on her pillow, closed her tired eyes.

When she awoke Levison was standing by the window, through which the first faint rays of the morning sun were shining into the room. The only sounds were the steady drip of water from the choked gutters of the eaves and the tinkle of china in the kitchen.

"The storm—when did it pass?" she asked anxiously.

Levison turned. Despite his smile, there was a look almost of horror in his eyes.

"It lasted nearly six hours. Then it ceased as suddenly as it began. Such fury! It must be unprecedented. I can't make it out. Unless—"

She sat up. "I came to tell you. It was Melvin's work—and mine. I feel I'm as much to blame for the havoc it must have caused. I helped him to build the machine. . . ."

He listened patiently while she told him, right from the beginning. If he felt any surprise, he did not reveal it. He did not even flinch when she told him how she had found the plans of his Thought Amplifier in Melvin's safe. She told him of her own constant suspicions and how she had repeatedly dismissed them from her mind; how her admiration for Melvin had proved stronger than her mistrust. Until, now that he had revealed himself as a vindictive ingrate whose sole object was to satisfy his mad lust for power, her affection for him had turned to bitter hatred and disillusionment.

"He's a dangerous man, Levison," she insisted, finally. "A genius, yes, but an utterly unscrupulous one. If he becomes Master of London, it can only end in slavery and misery for the people. He would be a ruthless tyrant, and he won't rest until he has the whole world in his grip. Unless he can be stopped—"

Levison Read only smiled, though



there was still that look of deep concern in his eyes.

"He's more of a fool than anything," he said quietly. "I might have known he was responsible for this. But he won't get very far with his terror and destruction. There have been other fools. . . ."

SLOWLY MELVIN READ turned away from the visi-screen, unfastened the clips of his heavy insulated suit and stepped out of its protecting folds. For a moment he stood regarding the massive machine, now silent and inactive, its deadly work complete. He grimaced as he sniffed the heavy, stale air in the laboratory; then he turned to the door, opened it and went swiftly along the passage. He climbed the steps, passed through the house into the cool atmosphere outside. He noticed that his own dwelling had not escaped the damaging effects of the storm, but it had not fared too badly.

A fresh wind was blowing from the east. The last clouds of the great storm were drifting westwards like a retreating armada, dead black against the grey dawn sky. Keenly he surveyed the landscape, and as his gaze settled on the soft, red glow reflected above the centre of the city a smile came slowly to his lips.

He'd done it. In spite of Lalia's crazy attack on him, her foolish treachery, he had done what he had set out to do. He had laid there dazed for some time after she had fled, and had come to his senses to find the machine still running, the storm almost at its height. For hours he had watched it through the television periscope, exulting in its terrible abandon, its wild, flashing fury. Until at last, content, he had stopped the machine and the tempest had gradually subsided, leaving him to contemplate the havoc it had caused over the whole area of the city and beyond.

But it was not enough to remain there, concealed, viewing his handiwork from a distance. He could not resist the temptation to go out into the streets to see the devastation he had wrought at close quarters, to see the effect on the city's inhabitants of this catastrophe

whose true nature they had yet to learn. He had given them an abundant demonstration of his power. When he was their Master they would respect him all the more for that. But first he must seize the Mastership; they would not know until later that the storm was not a natural phenomenon, if an unprecedented one.

Lalia, of course, would talk—if she still survived. If she was dead, so much the better. He had been a fool to trust her as far as he did. But she had been useful. Now he could forget her.

He drove the car out of the underground garage and along the road, still flooded from the deluge. Making towards the city's centre, he soon gained a closer, grimmer perspective of the disaster he had created. Crumpled villas, fallen trees, swirling waters covered with driftwood, presented a picture of widespread destruction in the outer circle of the city.

It grew lighter as he came nearer to the inner section, where he was forced to abandon the car and proceed on foot to observe the utter chaos that revealed itself in the battered streets. Everywhere he looked he saw tangled girders and shattered masonry where tall, stately buildings had stood. Commercial Tower had gone, felled by the merciless lightning. The Science Institute had suffered, one wing a great pile of broken concrete and twisted steel. The Weather Bureau and the Ambassadors' Building were only two of the blackened, smoking shells left by devouring flames which even the rain had failed to quench. Elsewhere, in many parts of the city, fires were still raging, defying the weary, grimy men who still strove to defeat them.

Through the streets, too, wandered little aimless groups of men, women and children who had been driven from the wreckage of their homes; while others were curious sight-seers, gazing stupefied at scenes of devastation and horror. Rescue squads worked ceaselessly amid tumbling ruins. Ambulances raced, bells ringing wildly, or stood vigilantly by while sullen bulldozers shoved aside debris. As Melvin neared

the city's shattered heart the activity increased.

"Terrible, isn't it?"

He turned sharply. A stocky, well-built man with tousled hair and dirty, perspiring face stood at his elbow. There was bitter sorrow in his eyes; his mouth was shut tight as though in an effort to master his emotion. His clothes were torn and he held his left arm in a rude sling beneath his empty sleeve.

"Pretty bad," Melvin admitted almost grudgingly. Somewhere within him was a strange feeling of discomfort which he had been trying to analyse even as he strove to conquer it. It was not remorse—it could only be nausea. He had no regrets. He had set out to accomplish this, and he had succeeded. For him it was triumph, not tragedy. Yet now he could feel none of that splendid satisfaction he had tasted when he first surveyed the landscape from the laboratory. The finer details were a little—distasteful.

"I was in a telecinema with my wife and two kiddies," the man said absently. "We heard thunder, but thought nothing of it. Then the whole place caved in. My wife and kids were crushed under a steel girder. They got me out. I wish they hadn't..."

"I'm sorry," Melvin wanted to get away from him, but the man suddenly grasped his arm with his free hand as though anxious to unleash his feelings now that he had found someone who would listen.

"I can't understand it, can you?" he went on. "That storm—it was no ordinary storm, was it? It *couldn't* have been. There's never been another like it. I wonder—"

He broke off, peering into Melvin's face. "I'm sure I've seen you somewhere before, haven't I? At the Science Institute, perhaps—"

Melvin smiled faintly, threw off his morbid feelings. There was no reason why he should conceal his identity. The whole of London would know him soon enough. His name would be on every lip.

"I'm Melvin Read," he said. "Vice-Chief of the Electrical Department."

"Why, of course!" The man brightened, held out his hand. "I'm Curtis Townsend, engineer. We must have met. I often have business at the Institute. I knew Mernas Steele very well. Latimer, too."

Melvin frowned, feigning surprise. "You *knew* them? You mean—"

"You haven't heard? It was on the radio. All stations broke down when the storm was on, but they've got going again. They're putting out bulletins, they tell me. The death roll's estimated at ten thousand, maybe more. Several big names among the missing, the Master and Chief Scientist included. They're dead for certain—no trace."

Melvin's pulses raced. It was just what he had hoped for. Now was his opportunity.

"Then the city's without a leader, a central authority. There will have to be an election," he urged.

Townsend's face was blank. "In time, I suppose. The administration's still functioning as best it can, but it will take weeks to clear up this mess. Someone will have to shoulder the responsibility in the meantime. It's no light task—"

"I'll take it on," Melvin's voice was challenging, though he tried to conceal his eagerness. "I was next to Mernas Steele, have all the qualifications. If things are left to the petty officials they will all be quarrelling among themselves and nothing will be done. The people must have a leader, someone whose word is law and whom they can trust, or they will get out of hand. If I speak to them I'm sure they will put me in that position until we can have a proper election. If you and your friends will give me your support and nominate me I shall not easily forget it."

Townsend ruminated, his personal grief forgotten in his earnest for the city's welfare. He had heard of this Melvin Read in the influential circles in which he was privileged to move, even if he did not strictly belong to them. Men spoke his name, he remembered, with something of envy and respect, while treating him as an inferior. Perhaps if he threw in his lot with him. . .

"There's something in what you say,

and I admire your public spirit," he confessed. "Of course, I'm only an engineer—"

"And the very man I want to have charge of the rebuilding of the city," Melvin encouraged.

"Then you can count on my full support. Come along to my office and we'll see if we can get you on the radio once we've got your nomination through. The people will acclaim you—I've no doubt of that. Yes, Melvin Read for Master it shall be!"

THE REACTION of the people to Melvin's appointment as temporary Master was enough to show their willingness to accept any leader who could inspire them with the courage and determination that were most needed in the present emergency. The harassed administration welcomed him as one who was prepared to relieve them of the burden of responsibility in a crisis they could not cope with; and those of the Intellectual Circle who were loath to accept him were at least prepared to grant him the extra burdens of his office while they lasted. Later, when he had reorganised affairs sufficiently for an election to be held, he could be easily deposed by a candidate more to their liking.

But Melvin Read, having grasped his opportunity, was quick to exert his new power in a way that would ensure his retention of it. He spared no pains to persuade the people that he alone could give them the betterments they craved by his ruthless domination of the whole community and its resources of capital and labour. Within a few days, the city's three hundred thousand homeless had been given fresh shelter and the work of repairing the tens of thousands of damaged homes and buildings had begun, under the direction of Townsend. With prospects of such a swift rehabilitation, the people's hopes rose as they demonstrated their confidence in the new leader.

But he, conscious of the precariousness of his position, knew he could not rely on fickle popularity to defeat the more subtle forces arrayed against him. If his bid for power failed, he must resort

once more to the Elements Controller, that master bargaining weapon which would always be more valuable than votes. At the same time it was imperative that the secret of the machine be kept. Beneath the ruins of his home it was safe enough, but he had to have access to its violent strength at all times, against any emergency.

Only he knew the purpose of the complicated switchboard which was promptly installed in his office in the Science Institute, where he made his temporary headquarters until the rebuilding of Commercial Tower. Much less did those few who were aware of its existence realise that behind it was an ingenious remote control apparatus which enabled him to operate the Elements Controller with the same facility as if he were in the underground laboratory where it was concealed.

But the precaution proved unnecessary. When, within two months, he was forced to accede to the demands of those who opposed him and submit himself for election, the people clamoured for him to remain in office rather than accept any of his rival nominees. His forthright methods, coupled with his assurances of continued progress to benefit Intellectuals and Workers alike, had brought him general approval, and he found himself with the Mastership for a further period of two years.

Engineer Townsend was the first to call at his office on the morning after the election.

"You deserve it, Read," he said warmly. "You've done wonders. The people want a man of action."

"You've done well, too," Melvin acknowledged. "But we still have to move faster. We need more labour. The other cities can't or won't co-operate, so what we can't get from outside we must get from within. We shall have to be ruthless. My first act will be to conscript everybody within a hundred miles radius into the Workers' Circle, to help with the rebuilding."

Townsend raised his black brows. "That's not going to be very popular, is it?"

"Perhaps not. But I want to see this

city rebuilt—and quickly. We need more houses for the workers, and until they have them we shall never make progress on the bigger schemes for which we are all impatient. The whole of the city is too crowded. I want to see it expand still further into the countryside. The inner circle will be enlarged to the present limits of the outer circle, which will spread out beyond that. We shall absorb the small towns and the few villages that are left, cover the fields with houses, keep such open spaces as are necessary. London needs more territory—and more Workers. There are too many Intellectuals. You understand?"

The engineer looked doubtful, but he nodded. "You want me to get started on this expansion scheme?" he asked.

"Very soon. Of course, it will take time. But we shall work as fast as we can—keep the people occupied. Meanwhile, I have other plans which do not concern you."

"I see." Townsend lowered his gaze. "Well, you can rely on me."

As the door closed behind the engineer Melvin Read sat back in his chair, musing. His pensive eye lighted on the wall-safe where the plans of Levison's Thought Amplifier still reposed, neglected but not forgotten. In the two months which had passed he had heard nothing of his brother, nor of Lalia. Perhaps they had both died. She, at least, would surely have come to him in the hour of his triumph, asking his forgiveness, wanting to share his success. He had to make certain, now, that he was rid of her. And of Levison. . .

THE MAN in the dark grey uniform, standing at the door of the bungalow, announced his business in a tone that brooked no argument.

"You are instructed to come with me to London immediately for essential employment in the Workers' Circle. Here is my authority."

Levison Read took the paper the officer held out to him.

"You understand," he emphasised, "you are to come immediately. Accommodation will be provided for

you. This house and your belongings will be taken care of by the authorities until your services are dispensed with, but it will be necessary for you to live with the Workers for the time being. Bring with you only the things you need—"

"But what is this?" Levison found his voice. "Emergency Order? Recruitment of labour?"

"If you don't come willingly I shall have to arrest you," the officer threatened. "The vehicle is waiting just along the road. You won't be the only one. I'll expect you there in ten minutes."

He was about to turn on his heel when he caught sight of the girl coming into the passage. His eyes raked her.

"Your wife?" He leered.

Lalia answered before Levison could speak, giving her name and explaining that she was staying at the bungalow because her own apartments had been destroyed in the Great Storm.

"Lalia Melbridge, eh? Lucky for me. I've been looking for you, Miss Melbridge. Two birds with one stone."

He searched through his papers, handed her a document similar to the one he had given Levison. "You'll have to come along too." He winked heavily at Levison. "If you're good, perhaps they'll fix you up together. Don't forget—ten minutes."

He was gone. Lalia looked up from the paper, her blue eyes puzzled.

"But this is absurd! If this is some of Melvin's work—"

"He doesn't waste any time, does he?" said Levison. "So the Intellectuals must become Workers, by order of the Master! He's running his head into trouble already. But we'd better get ready."

Lalia's frown turned to a look of complete bewilderment. "You—you mean you're going? Under threats? You're going to let him force you to give up your work on the Amplifier? That's just what he wants—"

"If we refuse we shall only be playing into his hands, giving him an excuse to put further pressure on us. It won't hurt us to live in the Workers' Circle for a while. It will give me a chance to protest against his high-handed

actions—to meet him face to face if I can. Yes, I think we'd better go."

She was still inclined to doubt when they took their seats in the great three-decker motor-bus outside, into which many others like themselves were climbing, carrying suitcases and parcels of intimate belongings. But she knew it was useless to resist. For the moment, Melvin had the whip hand. They would have to bide their time.

The bus stopped once to pick up a little group of people waiting at the roadside with two grey-uniformed men, then continued on its way towards London. The passengers were silent, uneasy; there were a few feeble protests but no more. The officers were grimly uncommunicative. The prospect looked bleak.

The bus reached the outer city traffic levels, entered the drab regions of the Workers' Circle with its rows of little grey houses. They passed many ugly spaces littered with the debris of those which had been torn down, either by the storm itself or in consequence of its toll of damage. In every street gangs of workmen toiled at the task of reconstruction. Eventually the bus pulled up outside a public building. The officers herded them out, up the wide steps and into a queue which trailed through the great hall to a door labelled "Registrations."

When at length they reached the table where a flint-faced official sat ready to ply them with questions in their turn, Levison spoke up:

"I wish to appeal against this treatment. I am engaged on important work."

The official glared. "There is no work more important than the rebuilding of the city. The Master has ordered that you shall be engaged in such work, at least until you can be spared for less urgent matters. No appeals against that decision are permitted. Your name, please!"

"Levison Read. The Master is my brother—"

"That makes no difference. Kindly reply to the questions. . . . Occupation?"

Levison hesitated, seemed as though he would carry his protest further, then

gave up the struggle with a shrug. He made his replies mechanically, moved aside to make way for Lalia. The officer ignored the defiance in her voice as she gave her particulars. At the end he looked up and announced to all and sundry:

"If there is anybody who feels inclined to question the Master's judgment in this matter, may I remind them that the Master has the right under the Act of Mastership to make whatever order he chooses in an emergency, without reference to any other authority. Next, please!"

IT WAS ONLY by degrees that Levison and Lalia came to realise how completely Melvin's edict had them in its grip. They were given billets fairly close to each other and put to work in the same underground factory; there were ample facilities for recreation, and as long as they were content to adapt themselves to their new mode of life they were not interfered with. But they were under constant surveillance by the grey-uniformed police who patrolled the Workers' Circle night and day, ensuring that they did not pass the jealously guarded barriers into the city's inner circle without a special permit. To impress upon them even further their loss of Intellectual status, they were obliged to wear the drab olive-green dress of the Workers at all times.

By patient application to the proper authority, Levison gained permission to retrieve the apparatus and equipment he needed to continue work on the Thought Amplifier in his periods off duty, and the little room which Lalia visited every evening soon had all the appearance of his Paradise Acres workshop, except for its cramped dimensions. Though greatly handicapped, he laboured more diligently than ever, while Lalia helped where she could. But as the days lengthened into weeks and their enforced duties in the factory grew more and more irksome, she grew impatient, resentful.

"We've got to do something, Levison," she told him yet again. "We're just letting Melvin have all his

own way. While he has you chained down here, working only when you're free from your factory bench, you will never do the job before him. For all we know, he may have this thing practically finished. And when once he starts to use it—"

Levison looked up from the delicate piece of apparatus to which he was making adjustments.

"We're very lucky to be able to work on it all, Lalia," he reminded her patiently. "Don't forget we're not the only ones to have our work interrupted. At the bench next to me at the factory is a professor of physics—"

"I know!" Lalia had grown tired of his attempts to console her. "But Melvin may not even know we're alive. Some official must have put our names down on that list of Intellectuals who have been turned into menial Workers—slaves, in fact; for that's all we are, all we ever shall be. There are thousands of us, all doomed to this existence for the rest of our lives if Melvin gets his way. But if he knew *we* were here, he might have the decency to reinstate us."

"And let us work on the Amplifier, which he wants to use for his own ends? You know that's not reasonable, Lalia. We've been here two months. If he thought we were alive, he would have sought us out by now. At least, he'd have seen to it that I wasn't allowed to continue my work here. I'd have been refused permission. No, it's best to let things stay as they are."

Lalia's eyes flashed. "How do you know he isn't doing it deliberately—letting you get on with the job while all the time he's got you tied down? When you've finished the Amplifier, he'll step in and confiscate it. We're helpless either way. If only we could find out how much he knows, how far he's made progress!"

"I think we should wait, Lalia," he insisted gently.

But she could wait no longer. She could not bear to see Levison toiling night after night, getting no rest, when all his efforts might be in vain. She had to see Melvin, to find out the truth. He need never know that Levison lived, if he thought him dead. She could

delude him; perhaps persuade him, in spite of what had happened, to reinstate her so that she could use her influence to get Levison released from his slavery without Melvin's knowledge.

Her mind made up, she did not hesitate. Leaving Levison to his labours as early as she could without exciting his suspicions, she made her way through the deserted, ill-lighted streets towards the narrow belt of grassland which separated the inner rim of the Workers' Circle from the centre of the city. Soon she came to one of the great portals through which all traffic entering the inner section filtered to the various levels, and where a pedestrian was such a rarity that only a single narrow subway on either side of the towering arch had been provided for foot passengers, as though as an afterthought. Beyond the portal, a flood of light from the great city buildings, resplendent with flashing sky-signs, reached into the heavens to put the stars to shame.

As she drew nearer the subway entrance, Lalia searched in vain for some suggestion of shadow in which she might escape the mechanical eyes of the grey-uniformed police who made their vigil here, ever watchful lest some unauthorised Worker attempt to enter the forbidden precincts of the city. But it was impossible to gain the subway without passing their observation posts, smooth domes of shining plastic from whose summits revolving lights swept the footway with their merciless beams. Once she stepped into that light they would see the olive-green uniform that marked her as a Worker, and a Worker had to be questioned. It was unavoidable.

For a moment Lalia stopped, blinking at the whirling rays of light, and wondered if she should not wait until she could obtain a permit to enter the city on some legitimate errand. But the formality would take time; the document would require her Overseer's signature. It was all designed to discourage Workers from encroaching on the rightful preserves of the Intellectuals. She had to see Melvin now—that night; he would almost certainly be working in his office in the

Science Institute. She would get there somehow.

She continued towards the subway, whose dim inner lights seemed poorer still against the bright glare outside. She almost ran, knowing that if the men in the observation post saw she was in a hurry they would keep her waiting longer at the turnstile before they started their interrogation. Just before she reached the viewplate which would present her life-size image to them inside the post, a mechanical voice grated :

"Halt ! Stand by for questioning."

But she did not halt. Instead she plunged forward into the ill-lit subway and, keeping as close to the wall as she could, ran faster than she had ever done in her life before. She had gone ten yards when the robot voice repeated : "Halt ! Stand by—" "Then a human voice commanded, "Stop, or I'll shoot !" as she heard the clatter of heavy boots behind her ; someone inside the post must have moved as fast as she.

She was almost on the point of staying her headlong progress down the straight, narrow tunnel when something blazed behind her, a fierce burst of pain racked her spine, and she fell into a pit of absolute blackness.

LALIA HAD BEEN gone less than an hour when Levison Read was startled by a sudden peremptory knocking on the door of the billet. He was alone in the house ; the others always spent their evenings at the Recreation Centre. Hurriedly he pushed aside the apparatus on which he was working, and went downstairs to the door. A man in Workers' Hospital uniform stood waiting. There was a car in the road outside.

"Levison Read ?" he asked briefly, then went on at the other's nod. "A girl named Melbridge was shot by the police while trying to pass the barrier without permission. She's in hospital, in a pretty bad way—gave your name. You can come with me."

As the car sped through the narrow streets, Levison's mind was an agonizing muddle of hope, fear and regret. The few minutes before he was standing at Lalia's bedside, looking down at her

white face, seemed an interminable age.

"Only a moment," the nurse cautioned as she left them.

"Hello, Levison." The girl's whisper was almost inaudible. "I—I tried to see Melvin—but they stopped me—"

Bitter anguish showed in his eyes as he leaned over the bed. "Whatever made you do it, Lalia ? I would have gone myself if I'd thought—" The words choked him. He could only gaze at her, tenderly.

"Never mind," she whispered. "You know best. If—if I don't get better, I want you to know that I'm still on your side."

He nodded dumbly. She lay staring up at him until the nurse intervened. A moment later, in the corridor outside, he realised dimly that a doctor was speaking to him.

"We operated the moment she was brought in. We saved her life, but there is a bad spinal injury. She will probably find it difficult to walk again. . . ."

Levison wandered out into the street in a daze. Never to walk again—Involuntarily, his fists clenched. This was another piece of Melvin's hateful work. Lalia was right—they had to throw off these shackles he had put upon them, to prevent him doing them further injury. *He* had to show him that with all his power he could not succeed in his crazy scheme of domination. He had to match that power with his own—*now*.

The numbness passed from his shocked mind, gave place to a burning sense of injustice which flared into a raging fury towards his brother. Spurred to sudden activity, he swung round, hurried back into the hospital forecourt where a small autogyro stood parked. Keeping well in the shadow, his eye on the solitary figure in the light of the main entrance, he opened the door, slipped into the seat, set the vanes revolving as soon as he heard the first soft purr of the engine.

The man in the doorway turned, stared out into the gloom, waved a hand wildly and came running across the forecourt towards the plane. Levison waited until he was three yards away, then opened the throttle wide. With a

lurch that turned his stomach, the plane leapt straight up into the air.

He turned on the jets, climbed swiftly up above the hospital roof, and stilled the whirring helicopter as he brought the machine round towards the blaze of light marking the city's centre. Within seconds he hung suspended over its twinkling abysses. He peered down, searching; it was a long time since he had piloted his own 'gyro over London, but at last he made out the expansive roof of the Science Institute. He nosed down towards it, hovered motionless above it for a moment, then let the plane down to a gentle landing on the rooftop where several other tiny machines were parked.

He went down in the lift without encountering a watchman. The corridors were silent, deserted, though lights still burned here and there. He found an indicator, located Melvin's office on the third floor. The glass panel of the door glowed with light. He pushed the door open, went through the outer office to where another door stood ajar. He flung it open.

Melvin looked up with a start from the desk where he was studying a sheet of diagrams. At his side lay several pieces of apparatus which were not unfamiliar to Levison. The blood drained slowly from the Master's face as he sat there staring at the visitor in the olive-green uniform. At length he spoke.

"I—I thought you must be dead. I hadn't heard—"

"You could have found out easily enough, couldn't you?" Levison put the question calmly. His rage was gone now, leaving only grim determination. "The Master surely should be aware of all his citizens' welfare, Intellectuals and Workers alike. It might interest you to know that Lalia Melbridge also survived the storm—and that she now lies in a Workers' Hospital, paralysed by the shock-ray of one of your henchmen. She was trying to get to you, to plead with you, even though she now realises what a cold-blooded monster you are."

Uneasily Melvin rose from the desk, forced himself to meet the other's

challenging gaze. With an obvious effort he made his excuses.

"She attacked me in my laboratory, left me unconscious. If she had only approached me in the proper way I might have overlooked that. If she chooses to defy law and order, I cannot be held responsible."

"Law and order!" Levison's tone was not so cool. "Who are you to speak of such things? You who seek to thrive on violence—yes, and on thievery!" He waved a hand towards the apparatus on the desk. In a renewed burst of uncontrollable anger, he dived forward, swept it to the floor and ground its shining complexities beneath his feet.

Melvin's eyes gleamed hateful enmity. He tensed his body, hurled himself at his brother, fingers crooked like talons. But Levison was quicker. Flinging out an arm, he sent him staggering back on to a low settee where he sat panting, glowering evilly.

"You'll pay for this," he growled. "You can't attack the Master. I'll have you taught a lesson. I have the power—"

"Power!" The word came back like a boomerang. "Power! The power to destroy! Too much of that will bring you down before long, Melvin. You can't control it—"

"But I can!"

Melvin leapt to his feet as he shrieked his defiance. Levison backed away, then stood his ground, awaiting a second plunge. But instead of attacking him again, Melvin stepped aside, round the settee, and ran to the other side of the room where a shiny black panel stood out from the surface of the wall. He touched a button, slid the panel aside to disclose an array of switches and dials.

"You see! I have my power ready to hand—the power that put me here and will keep me here so long as I choose! Unlimited power! You've already seen what the release of that power can do, Levison. The Great Storm that almost destroyed London—it was I who caused it. And I can do it again!"

HE WAS RAVING now, drunk with wild exultancy. Levison watched him, half contemptuous, half pitying.

"You shall see!" With a hoarse



cry, Melvin slammed down a great switch on the panel, started to turn a dial while he kept a careful eye on Levison. "If you and Lalia try to get me removed, the whole of London will answer for it. Better think again, Levison. If you would only co-operate with me—"

He stopped and stared as he became aware that someone lurked just outside the office door, looking straight at him through the gap where it had been pushed partly open. Levison could see only a vague shadow behind the glass. Then slowly the door swung back, revealing a stocky, muscular figure standing on the threshold.

"Townsend!" Melvin's face whitened visibly, stark against the blackness of the switchboard. For a moment he struggled in indecision, laid a hand on the panel as though to close it, then let it fall to his side. He stood silent, lips twitching nervously, eyes shifting from Levison to Townsend and back again.

Townsend's tone was confident, commanding. "Release that switch!" he ordered.

Melvin hesitated again. He made a terrific effort to regain his composure, bunching back his shoulders, head held high.

"Who are you to give orders to the Master?" he demanded. "You had no permission to enter my office."

The engineer moved forward purposefully. He had reached the switchboard before Levison caught sight of the vibragun in his hand. Brushing Melvin aside, he reached up with the other, opened the switch, and turned to face them both. He gestured with the gun towards Levison, then levelled it straight at Melvin's breast.

"This man—your brother—didn't wait for permission either. His errand was too important. So is mine—now. I was coming to see you on a matter that is too trifling to mention—it can wait. I hadn't long landed in my 'gyro and was digging out some papers when this man touched down on the roof. I saw his Worker's uniform, followed him down to your office. When I first saw his face I thought it was you, though I couldn't understand the dress. When I heard you talking, I learned differently. I learned a lot of things—things that have been troubling me for some time but which I couldn't fit together before."

His tone was quietly conversational now. Melvin stood glaring at him, his chest heaving rhythmically, while Levison



watched impotently. The stocky man went on.

"I always knew there was something funny about that storm. There was that beam of violet light that some were supposed to have seen, which led to talk of invaders from space—absolute nonsense! Lots of people had theories—all sorts of fantastic ideas which they put over the radio. But I never could accept the scientists' verdict that it couldn't be anything but a natural phenomenon. It was too restricted, too concentrated. There never was a storm like that, and there never will be again."

He looked at Melvin with narrowed eyes as he spoke the last few words, slowly and deliberately. He glanced quickly at Levison, then resumed in a voice that trembled slightly.

"I lost my wife and youngsters, all I had, in that storm. Thousands died and suffered through it, and are still suffering—because of you, Melvin Read. I was a fool to let you use me in your climb to power, but I'm not the only one you've used for your own ends, it seems. This apparatus—" He nodded towards the broken pieces on the floor, turned to Levison again. "It's some invention he's filched from you. It must be important. What is it exactly?"

Levison told him, briefly. Melvin's face showed dull resentment. Twice he made an effort to speak, but each time Townsend silenced him abruptly.

"The power to influence men's minds. . . ." The engineer considered, his gaze wandering aimlessly for a moment. Then he smiled grimly at the Master. "To think what you would have done with that! But your reign of terror's at an end, Melvin Read. You'll never be able to satisfy your conscience, perhaps, but I'm going to do what I can to quieten mine. We put one Master in power. Now we'll replace him with another—one with rather different motives, if I'm any judge. And without any formalities or elections, either. What do you say, Levison Read?"

Levison was startled by the sheer audacity of the notion. "You mean that I should take Melvin's place? I don't want power—"

"You have the power! You can work miracles with that invention. Your brother's crazy lust for it is enough indication of that. But he wants to destroy—you want to build, to cure. Well, now's your chance!"

He spoke rapidly, urgently. When I entered this room, I tell you, I did so with the intention of shooting this blackguard down where he stood, not only for what he's done to me but to avenge the thousands he's sinned against. He deserves to die—and I'm still tempted to give him what he deserves, even if you try to stop me. But it will do me no good—I'd have to pay the penalty or blow my own brains out. There'd be a scandal; the people would lose what little faith they have left in the Master, and our enemies would make the most of it.

"You're his twin. He must go—you have all the qualifications that are needed. If you stepped into his shoes, we could go on as if nothing had happened, except that you'd take a different line. The people would accept you; our opponents would never know. You'd have me to stand by you—"

Levison's mind was a turmoil of confused thoughts. "But—but Melvin—"

Townsend waved his gun. Melvin nervously watched his every movement. He was thoroughly frightened now. He clutched at the chance desperately.

"Yes—yes, take my place, Levison! You deserve it. So does Lalia. I know when I'm beaten—I'll go away."

"Take off your clothes," Townsend told him. "Levison, give him your Workers' uniform."

Silently, while the engineer watched, the brothers exchanged clothes. Neither of them saw the peculiar smile which flickered briefly on Townsend's lips.

THE MASTER of London raised his eyes from his desk, gazed through the huge window at the skeleton fingers of metal which pointed upwards, here and there, between the network of girders and the mass of newly-finished buildings below. He nodded approvingly to himself, leaned back in his chair and sat reflecting. The city wasn't such a

bad place, after all. And it would be better still. . .

A glow of light suffused the audio-screen on the desk, rousing him from his reverie. A voice announced: "Miss Melbridge." Levison responded briefly, eagerly. In a moment Lalia was in the room.

"I had to see you," she said, her blue eyes shining. "The 'visor is so—impersonal."

"I'm glad you came," he replied. "Did you see—him?"

Her eyes clouded. There was sadness in her voice. "It was all I could do to persuade him, but he finally agreed to place himself in Dr. Seldon's hands. I told him what the Thought Amplifier had done for me, how it had fulfilled all your expectations in curing hundreds of cases of disease by influencing the mind. He tried to convince me that his case was different, said the principle didn't apply where the tissues had been damaged by harmful radiations such as those from his machine. If he had thought at the time, he said, that his exposure to them might have such an effect after three months, he would have taken steps to ward it off. But it was only recently he began to suspect that his brain had been affected while he lay there in the laboratory unconscious, without his helmet, on the day of the Great Storm.

"I pleaded with him, told him I felt I was to blame for having left him there exposed to those deadly radiations. But he insisted it was his own fault for meddling with forces that he couldn't properly control. He was a little hysterical—he's very ill, Levison. He realises, now, in spite of his growing madness, that his craving for power and his misuse of it once he had it in his grasp could only bring about his

downfall. He's completely penitent—and wretched."

Levison looked anxious. "But he did agree to submit himself to the Amplifier?"

"He said he would try it, if only for my sake, so that I would have nothing on my conscience. Though he insisted I shouldn't have, and that he didn't deserve to escape—his penalty, he called it. Since he first realised his illness soon after he went away, he's been resigned to his fate, waiting for it. He thought of killing himself, but he said he hadn't the courage—the courage that you had, Levison.

"He was full of admiration for you and what you have accomplished. The rebuilding, the replanning, the abolition of the Workers' Circle, their equal status—he praised them all. You had a sense of *rightness* he could never have, he said. And your scheme for the universal acceptance of the Amplifier, to rid men's minds of fear and mistrust and to promote the ideals of human progress—he was all in favour of that, too. He's a changed man, if a *hopeless* one."

She brightened. "But Melvin will live," she added confidently. "The Amplifier will heal his brain and restore his mind, just as it will improve the minds of millions, stop all the muddled thinking and prejudice that hold us back. It's a perfect instrument for good, Levison. With it, we can remake the world. Or *you* can—for as you've always said, the responsibility lies with you."

He got up from the desk, stopped to stare once more through the window at those gleaming fingers pointing towards the sky. He turned to her, smiling.

"Let's try together, shall we?" he said.

## THE END



# The Moon Men

By WALTER GILLINGS

*The story of a famous piece of science-fantasy . . . and some facts which suggest that it might not have been more than a slight exaggeration.*

HAD IT BEEN 1946 instead of over a century ago, the headlines might have screamed :

## GIANT EYE SEES LIFE ON THE MOON

Instead of which, quite a modest, small type heading topped the column in which the New York *Sun* began to relate the sensational story of the "Great Astronomical Discoveries lately made by Sir John Herschel, LL.D., F.R.S., etc., at the Cape of Good Hope." A story which, appearing day by day in the last week of August, 1835, made its readers' eyes pop with astonishment and sent them scrambling for the next day's paper

to goggle at its further wondrous revelations.

For the famous astronomer, it seemed, had built a marvellous telescope "of vast dimensions and entirely new principle" with which he had made "the most extraordinary discoveries in every planet of our Solar System", had descried planets in other systems, and by observing the surface of the Moon at an apparent distance of one hundred yards had "affirmatively settled the question whether this satellite be inhabited". In short—and this was what intrigued the *Sun's* wide-eyed readers—there were men on the Moon. Men with wings!

There were animals, too, and trees and

lakes and rivers, very much the same as on Earth. The astronomer had seen them. It was all in the paper, so it *must* be true even if it did sound fantastic. Though not when you read it, it didn't.

The first article carefully prepared the way for the "thrilling wonders" it promised would follow. It described how, with the help of the noted scientist Sir David Brewster, the younger Herschel had overcome the problem which had beset his father, Sir William, who had spent years on the improvement of the telescope before he discovered Uranus. This difficulty was—and still is—that the more an image is magnified the more indistinct it becomes, so that eventually the practical limit of magnification is reached.

Bigness, in astronomy, isn't as important as clarity when it comes to making detailed observations. The bigger your image of the planet on which you train your telescope, the more distortion you have to contend with from magnifying the ripples in the atmospheric blanket through which it looks out into space. For this reason, even the 200-inch monster of Mount Palomar, California, won't enable us to see the nearer planets in any more *detail* however much bigger it makes them appear. It will be used almost entirely for a photographic survey of the hundreds of thousands of distant stars and nebulae it will disclose to view more readily than anything we have already seen on the Moon, or even Mars, through much smaller telescopes.

But Sir John, according to the *Sun*, had considered the principles of the hydro-oxygen microscope in tackling the problem of unlimited magnification, and had hit on a way of "transfusing artificial light" into a telescopic image so that it would retain its brightness and distinctness however much it was enlarged. This idea, incidentally, had so impressed Sir David Brewster that he "leapt halfway to the ceiling in an ecstasy of conviction." But greater triumphs were to come.

Having secured the financial support of the Royal Society, Sir John proceeded to build his super-microscope-telescope, for which an object glass twenty-four feet

in diameter was cast. The weight of "this prodigious lens" was nearly seven tons after it had been ground and polished, and with its magnifying power of 42,000 it was expected to reveal objects on the Moon's surface no more than eighteen inches in diameter. Indeed, the optimistic astronomer "expressed confidence in his ultimate ability to study even the entomology of the Moon, in case she contained insects!"

Amid a mass of technical detail concerning the workings of the instrument, it was recorded that the casting of the giant lens was done in nine days. A few years ago, when the 17-foot mirror of the California telescope was big news, much was made of the fact that the process of casting and grinding its twenty-ton mass took nearly three years to complete. But that again is by the way . . .

THE *SUN* went on to tell its eager readers how the Herschel telescope was transported and set up on Table Mountain, giving a complete description of the observatory with its "ponderous and complicated machinery". They were informed that until it was actually in use it remained a well-kept secret; and even after Sir John had reassured them regarding a menacing comet which was supposed to be heading for Earth, the astronomers of Europe remained in ignorance of the means whereby he had observed its change of tack. Then the monster was turned upon the southern sky and "a countless number of new stars and nebulae were discovered", before the full power of the instrument was directed towards the Moon.

The first view to which the observers were treated, as they gazed at a screen on which the image was projected, was of several huge columns of greenish-brown rock covered with red poppies. Their conclusion that the Moon must have an atmosphere capable of sustaining plant life was supported by the sight of other Lunar vegetation similar to Earth's: forests of firs and yew trees, and level, grassy plains. Then they saw, amid the lofty mountains of the Moon, a great inland sea corresponding in shape to the *Mare Nubium* or Sea of Clouds, with "a

beach of brilliant white sand girt with wild rocks, apparently of green marble". Upon this strand the blue waters broke, presenting a picture which left the astronomers speechless; "for fairer shores never angels coasted on a tour of pleasure".

Further examination of the Lunar landscape revealed tracts "rugged and volcanic", valleys bare of all but stones and boulders, and others sprouting chains of slender pyramids, "of a faint lilac hue". At first these seemed like obelisks erected by intelligent beings, but on closer scrutiny (the proximity of view could be adjusted at will) they were found to be formations of quartz sixty to ninety feet high; in fact, nothing less than "monstrous amethysts, glowing in the intense light of the sun!"

At length they came upon a tree-lined valley, twenty miles wide, between precipitous slopes of red crystal. And there, in the woods, they saw the first signs of animal life for which they had been searching: grazing herds of what looked like small bison and an agile creature like a goat—except that it was blue and had a single horn growing out of its head. They called it the Valley of the Unicorn . . . On the islands in the river which flowed through the valley were birds of various kinds, some apparently engaged in catching Lunar fish.

By now thousands of New Yorkers, too, were busily devouring these details of the Moon's zoology. The *Sun's* articles were the talk of the town; its newsboys did a roaring trade. The series went on to describe Sir John's further observations of the Lunar mountains, seas and volcanoes, some of which were in a state of "terrific eruption", while others had long been extinct. In the many forests and prairies more animals were seen, mostly resembling those of Earth; though there was one similar to the beaver which not only carried its young in its arms but lived in huts from which smoke issued, as if it had knowledge of fire.

BUT ALL THESE discoveries paled into insignificance when at last the astronomers saw several flocks of flying

creatures which turned out to be as much like human beings as apes with bat-like wings. Four feet in height, with faces reminiscent of the orang-outang, their bodies were covered with short, copper-coloured hair; and they talked and gesticulated as they bathed in the rivers or lolled on the green banks, as though their existence was a bed of Lunar roses. Later, in another fertile valley, more of these bat-men were seen sitting about in triangular groups and eating the fruits of the forest, while around them browsed various Lunar fauna showing every sign of docility and contentment.

There was, too, evidence of the intelligence and skill of this superior race of winged beings, in the shape of three magnificent blue stone temples, roofed with a yellow metal and of utterly weird design. Eventually a still more advanced species was seen, whose beauty left them not far removed from the angels. And here the amazing story ended with a promise of further information concerning the Moon's inhabitants in Dr. Herschel's "authenticated natural history of this planet."

By which time the sales figures of the *Sun* had multiplied until it had the largest circulation of any newspaper in the world, even exceeding the London *Times*. And the Moon Hoax, as it soon became known for the stunt it was, is now as famous in the annals of the Press as it is infamous in the records of astronomy. It was, in fact, a clever piece of science-fantasy presented as cold truth, so ingeniously that all but the most disbelieving or well-informed of its readers swallowed it, hook, line and sinker. Only a few could see the frequent scientific inconsistencies in the otherwise plausible tale; for in those days the average man was quite ignorant of such matters, while astronomers themselves vied with one another in speculating on the habitability of other worlds.

It was actually the suggestion of a certain Scots philosopher, Dr. Thomas Dick, that there *might* be life on the Moon which had provided the inspiration for the hoax in the first place. Coupled with the indubitable fact that Sir John Herschel did establish a new observatory at Cape Town in 1834, where he made the



*Simplified map of the Moon, showing the principal features. Note that the image is inverted when seen through the telescope.*

first systematic study of the southern sky. But the account of his supposed Lunar observations was the invention of a journalist on the staff of the *Sun*, one Richard Adams Locke, who deserves to have gone down in history among the greatest romancers of all time.

What gave the extra touch of credibility to the tale was the equally non-existent source from which it was supposed to have been derived. It purported to be a reprint from a special supplement to the *Edinburgh Journal of Science*, which was no longer being published under that title at the time. It could not, of course, be exposed as the fable it was while the story was running, since the ocean cable was still a dream and radio an even more extravagant fancy than Lunarians. It was some time before Sir John Herschel himself heard about it, and it is said that

so earnestly had thousands come to believe in it that even he had difficulty in refuting it.

Meanwhile, in spite of the "innumerable certificates of credence" the *Sun* received from its contemporaries, there were one or two that cast doubts on the story. The *New York Journal of Commerce* was frankly sceptical, and after suggesting that the articles were pure fabrication, issued a challenge in the form of a request to see the actual supplement from which they had ostensibly been copied. Simultaneously, Locke, whose name had been associated with the series, was being pressed by two Yale professors for a glimpse of forty pages of technicalities and drawings which had been "omitted" as of little interest to anyone but a scientist. And in the end he was forced to admit that the

story was his own concoction, a confession which the *Journal of Commerce* triumphantly disclosed.

NOW, OF COURSE, we know better than to entertain such fancies seriously . . . or do we? We know—or think we know—that the Moon is an airless, waterless world of dead rock pitted with tens of thousands of great “craters” that are either the filled-in remains of former volcanoes or the scars made by giant meteors that bombarded the surface thousands of years ago. That is, if you can imagine a meteor—rather, a sizeable planetoid—as much as 125 miles in diameter. Adherents of the latter theory even contend that the *maria*, those smooth, dark areas you can see with the naked eye and which we were once content to believe must be the dried-up beds of ancient Lunar seas, may also have been caused by such collisions, so violent as to start flows of lava from inside the satellite, which in due course hardened to produce these great, level plains.

Since the days of Kepler, who suggested they were swamps in which the people of the Moon had built fortified cities, whose lofty walls protected them from the heat as well as their enemies, astronomers have argued about the desolate hollows and craters of the Moon. All sorts of theories have been formed to account for its other unearthly features, such as the “rays” which radiate from Copernicus and Tycho, and the deep chasms or “rills,” some of which are so straight as to suggest the handiwork of intelligent beings—or the remains thereof.

About the only things on which astronomers agree are the rugged mountains of the Moon, which make Earth's giant ranges seem dwarfs in proportion and whose heights we can measure more accurately than those of the Himalayas. That, and the fact that none of them can see the other side of the Moon, so that any guess as to the state of this hidden hemisphere is as good as another.

Hence the interesting idea of the Danish astronomer Hansen, that the Moon was not spherical but egg-shaped,

with the pointed end facing the Earth—like a gigantic mountain in itself, at the foot of which might be air and water confined in the “lowlands” on the other side. In which case, said he, this end of the egg—the real world of the Moon—could have vegetation, animals and all. But this fanciful hypothesis, made at about the same time as the Moon Hoax, has since been discarded as the result of such observation of the “other side” as is permitted by the Moon's slight wobble or *libration*. Astronomy is satisfied that the rest of the surface is doubtless much the same as the rather more than half of it we can see.

None the less, there are things there which, in spite of constant scrutiny by generations of astronomers, cannot be explained in the same way that they have accounted for the major mysteries of the Moon. Things which suggest that we can't be too certain about anything on this persistently baffling little sphere. Indeed, the more distinctly we observe, the hazier our ideas become. For instance:

In the *Mare Serenitatis* (Sea of Serenity), in the north-western quarter of the Moon, we can see a small, greyish spot which we know to be the crater Linne. It is only a few miles in diameter, and the depression is evidently too shallow to cast much of a shadow, because throughout the fortnight-long Lunar day the grey spot does not change its colour. Yet, *sometimes*, when seeing conditions are good and the telescope powerful enough, a tiny black spot can be detected in the centre of the grey circle.

What is it? No one knows. But supposing the Lunarians, if any, had been obliged to retreat *inside* the Moon, where air might still linger in the natural caverns which must have resulted from its former internal upheavals. Might that black spot be a hole—a door—through which the troglodytic Moonmen could on occasion emerge? Or at least gain a sight of the outside world . . . of *our* world?

FANTASTIC? THEN what of the equally tantalising changes in Eratos-thenes, on the southern edge of the *Mare Imbrium* (Sea of Rains)? This medium

FANTASY



sized crater measures some forty miles across its ring-wall, which rises 7,000 feet above the outer surface and 16,000 feet above the crater-floor. And upon that floor, some years ago, the American observer Pickering saw strange, grey spots moving and spreading as though they were alive. Others saw them too; selenographers don't have hallucinations.

Could they be some kind of plant life such as fungus, which not only grows quickly but whose spores can resist intense cold? Such cold as would kill all other forms of life during the long Lunar night, when the temperature on the surface falls to something like 150 degrees below freezing point. As for the equally extreme heat of the day: down in that great pit gases might lurk, serving to protect the quick-spreading plants from being shrivelled by the sun's rays, while allowing them ample warmth to thrive. At least, the discoverer of this weird phenomenon promptly termed the crater the "Garden of Eratosthenes". . . .

Then there is the peculiar formation near the chasm running through the crater Hyginus, in the southern portion of the *Mare Vaporum* or Sea of Vapours. This was spotted in 1822 by a German astronomer, Gruithuisen, who is credited with having had even more peculiar

ideas. The feature appears to consist of several mountainous ridges which have been partly buried in something—most probably it was lava which has hardened. But that doesn't entirely explain its queerly artificial appearance, even now.

Gruithuisen seized on the idea of its artificiality as the only explanation. To him, the ridges were the ruins of a system of fortifications surrounding an ancient Lunarian city. He made drawings of it, and the notion caught on, especially in popular literature. But when Mädler, some time later, made his famous maps of the Moon he replaced Gruithuisen's *Walkwerk* with a few small mountain chains crossing each other—and hardly did justice to the unnatural regularity of the formation, which has no counterpart on Earth. What it really is, nobody knows.

Men in the Moon—once, if not now? Mr. Locke, for the sake of the *Sun's* circulation, may have been guilty of much exaggeration, but we can't say exactly how much. One of these days we shall solve these Lunar riddles—not with a super-telescope, but with a space-ship that will take us there. But that's another science-fantasy . . . at least, for the moment.

THE END.

---

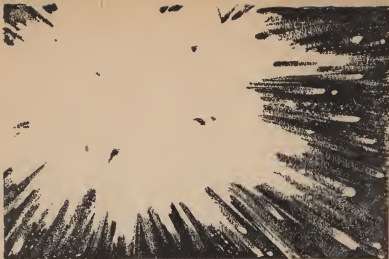
## Things to Come

**PREFABRICATION** —not of houses, but human beings! Is such a thing possible—to create synthetic life? And if it could be done, would it be a good or bad thing for mankind? It might depend on the motives of those who had the secret of manufacture of the new race of Entities. And if they held a monopoly. . . .

by E. R. JAMES

In the next issue of FANTASY

THE MOON MEN



# Supernova

By P. E. CLEATOR

*All the evidence pointed to a sudden, catastrophic end for Man and his planet. But only one man knew, and denied the world the knowledge. Fortunately . . .*

GARWOOD telephoned me at my club just as I was finishing dinner. He seemed highly excited, but would say nothing over the phone except to insist that I go out to his place immediately. I glanced at my watch. It was 8.30 p.m. Garwood's place was a good fifty miles outside the city and the only way of getting out there at that time of night was by road. I voiced this objection, but Garwood became more insistent than ever. The drive should take less than a couple of hours, and he had news of the utmost consequence to impart.

So, somewhat dubiously, I agreed to set off at once. Then he raised the question of Darlington. Could I get hold of him without causing delay?

Resignedly, I promised to see what I could do. Thus satisfied, he ended by urging me to hurry, and actually maintained it was a matter of life and death. But I didn't take this too seriously: Garwood always did get a little over-excited.

It so happened that I knew of Darlington's whereabouts that evening. He's a physicist by profession, and that night he was giving a lecture on electronics. With luck, he'd be finished by 9 o'clock. So I phoned the lecture hall and left word for him to await my coming.

It was a few minutes to nine when I reached the hall, and found Darlington in an anteroom sorting out his notes. He

seemed pleased to see me—until I told him the purpose of my visit.

"Garwood's place—tonight?" he exclaimed. "It's not reasonable! Besides, I've a supper appointment at Henry's—table booked and everything. Tell Garwood I couldn't manage it."

But I was not prepared to let Darlington off so easily. The three of us had been pretty close friends for many years, interested in one another's work—Garwood's an astronomer, and I'm a research chemist—and if our presence was really needed by Garwood there was no question but that we should go. So I argued the point, and my arguments finally prevailed. Ten minutes later we were on our way.

Before we'd gone many miles Darlington began to complain of feeling hungry—his mind was on his missed supper, no doubt. So we pulled up at a snack bar and took on board a stack of sandwiches. Having dined, I didn't fancy them myself, but Darlington munched steadily for most of the journey while I concentrated on the road, driving with all the speed circumstances would permit. Consequently there was not much conversation between us, though in a brief masticatory lull Darlington did voice his wonderment at Garwood's sudden and unexpected summons. But as we could do nothing but speculate as to the reason for it, we didn't get very far.

Personally, what with one thing and another, I'd seen very little of Garwood for some months, and didn't even know what it was he was working on. And unless I was much mistaken, Darlington knew no more than I did. In fact, we were completely in the dark—by this time, in more ways than one. It had been light enough when we set off, for it was mid-July, but dusk had overtaken us and passed us by. Fortunately there was a half moon, and with its aid we finally found ourselves at Garwood's abode.

Our arrival had evidently been anxiously awaited, for no sooner did the car come to a stop than the front door opened and Garwood himself appeared.

"Hello, there!" he called. "I'd almost given you up! Is Darlington with you?"

"I'm here," he answered as he clambered out of the car. "Though I'm hanged if I know why!"

"Come along in," said Garwood briefly. "We can talk over supper."

WE FOLLOWED Garwood into the dining room, and there laid invitingly on the table was a repast such as I hadn't seen in years: whole fried chickens, tongue, boiled ham, fruit salad and cream, and half a dozen other delicacies normally but a distant memory. If my expression was of questioning astonishment, Darlington's was one of wry dismay. Here was a meal in a million, and for the past two hours he had been stuffing himself with sandwiches!

"This is very acceptable, Garwood," I said.

"I guessed you'd be hungry," he explained, "and made due preparation."

"At least you might have given us some warning," complained Darlington feebly.

"Darlington's not too well—are you, Darlington?" I said with mock commiseration.

"Nonsense!" exclaimed Garwood. "What he needs is something to eat! Sit down. It's late enough as it is."

And so we set to. Or rather, Garwood and I set to, while Darlington toyed miserably. Garwood got down to business almost at once.

"You are doubtless wondering why I have dragged you out here at this time of night. Quite briefly, the explanation is that I am in a position formally to announce that by morning the world will have ceased to exist."

"You're joking!" I protested.

"I will go further," replied Garwood, calmly. "By morning, not merely the world but the entire Solar System will have ceased to exist. In fact," he went on, glancing at his wristwatch, "I'm rather surprised the end hasn't come before now."

Darlington grew visibly angry. "Really, Garwood, this is too much! Do you actually mean to say you've hauled us all this way at a moment's notice to tell us an idiotic tale like that? You must be mad!"

My inclination was to agree with him, for I was feeling a little indignant myself. But Garwood appeared quite unmoved.

"I am, of course, aware that religious cranks have been announcing the end of the world since the time of Adam. But mine happens to be a prediction based on scientific evidence."

"You say the entire Solar System will cease to exist. Do you mean that you think the Sun is about to explode?"

"Precisely, my dear Darlington-Watson!"

"But the Sun's good for millions of years yet," I objected.

"Normally, yes. But, as it happens, conditions are no longer normal. The Sun is in a pre-nova state and liable to disrupt at any moment—certainly within the next few hours."

So that was it! If Garwood were serious—and it seemed he was—it had to be admitted the thing was at least feasible. Every year, I knew, some twenty or more stars in the Galactic System alone suddenly flared up for no apparent reason, increasing in brightness by as much as 160,000 times or more. Such an explosion on the part of the Sun would, of course, almost instantaneously destroy everything for millions of miles around.

"How do you know this—and how can you be sure?" demanded Darlington. "No one's ever been able to detect the pre-nova state in stars before."

"You're quite right," Garwood agreed readily. "Until recently there was no certain way of telling whether a given star would become a nova or not."

"But you claim to have discovered such a method. Is that it?"

"Yes. And numerous tests have convinced me of its reliability—so much so that I believe it is infallible. With a special telescopic attachment, I am able to detect certain symptoms characteristic of the pre-nova state. Conversely, if a star is *not* in such a state, that fact is also made evident."

"And the Sun *is* in such a state?"

"It is!"

"Since when?"

"Since to-day!"

AS HE SPOKE, Garwood put his hand in an inside pocket and brought forth a sheaf of papers.

"Take a look at these," he invited, and passed us one each. They appeared to be lengths of ordinary barograph paper on which were inscribed an exceedingly complicated series of periodic curves. The sheet Darlington had was marked "Capella A." Mine was labelled "Sirius B."

"You are well aware," said Garwood, "that the process of a stellar combustion is sub-atomic, and that it comprises a cyclic nuclear chain reaction which goes on continuously within the body of the Sun. Those curves are a record of the process. You will observe that although both sets of curves exhibit certain similarities, there are essential differences. The reason is that two distinct types of star are concerned—in this case, a red giant and a white dwarf. In general, a given type of star produces a set of curves of an identical pattern."

We examined the sheets closely, but to me at least they were rather disappointing. To the uninitiated they might have represented almost anything. That Garwood was having a joke at our expense I did not believe; I knew him too well for that. But might he not be mistaken in the interpretation he placed on his results?

"Here," he went on, handing over two more sheets, "are the combustion curves of a couple of main sequence stars. You'll note that their two patterns are almost identical, but that there is little similarity between them and the patterns of the other two."

Well, that was plain enough, and even Darlington appeared impressed.

"I seem to remember," he said, "having read an account somewhere which listed the various stellar thermonuclear reactions. They came under three main headings, I think. One was simply a proton-deuteron reaction. The others involved protons and the lighter elements such as lithium, beryllium and boron, in a variety of isotopic forms."

"You're quite right. And it's those reactions which are represented by the curves you have before you. But take a

look at this. It was produced by a star in the Andromeda nebula."

So saying, Garwood passed across another of his sheets. The pattern of the curves began in a now familiar fashion, and it remained periodic for almost the whole of its length. But towards the end there was an evident break in continuity. The curves suddenly began to show an increase in amplitude until, with a final grand sweep, they ran off the paper altogether.

"That," said Garwood simply, "is the curve of a nova."

"And it's typical of all novæ?"

"Here are a few examples taken at random," he replied, passing over a dozen or more sheets. "You'll see that in every case the sudden spurt at the end is prefaced by a series of trigger reactions, each more violent than its predecessor. The warning I am thus able to obtain is, admittedly, woefully short. But it is a warning, for the outcome is invariably the same. In a matter of hours the star concerned suffers an internal explosion which bursts it asunder."

"And the solar curves," I queried, "show this trigger effect?"

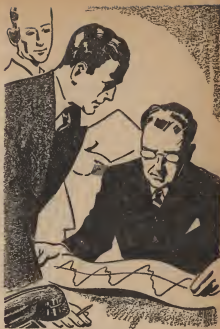
Garwood nodded gravely. "They do. But first, here's a specimen recorded yesterday, normal in every way." He handed another sheet over.

Darlington and I examined it carefully and at length. The curves were very much bolder, far more pronounced than any of those we had already seen, and the main sequence pattern was unmistakable. In the background was a confused series of faint lines, barely discernible.

"What are all these?" I asked.

"The Earth's contribution. They mark the process of terrestrial radio-activity. Such lines would normally be present on every record, and so would the solar curves, for the comparative nearness of the Earth and the Sun gives rise to constant interference. Fortunately I was able to devise a method of blocking such local effects; hence they do not appear on the other sheets you have seen. Finally, here is a record of the solar curves as they are to-day."

Silently he handed over yet another sheet. At a glance, the tale told by that



bit of paper was clear enough. There was the same series of calamitous curves, rapidly ascending from one peak to the next, that we had noted on the records of the novæ: the fatal trigger reaction that heralded the final, all-consuming explosion!

"If it affords any consolation," offered Garwood, "my experience of interpreting these curves leads me to believe that the Sun is about to become, not a common or garden nova, but a supernova!"

"That," said Darlington heavily, "changes everything. I'm so glad you mentioned it."

THEREAFTER, a silence fell between us. As luck would have it, none of us was married; we had nothing to worry about there. But I thought none the less of the countless millions of human beings throughout the world, many of them deep in sleep, and all blissfully unaware of their impending fate. Well, maybe they were the lucky ones, relieved as they were of the burden

of knowledge which we possessed. When the end came, they would not even have time to realise what was happening.

Garwood poured a round of drinks and passed across a box of really excellent cigars. We lit up, and Darlington, after an appreciative puff or two, suddenly burst out:

"I just can't credit it! The whole thing seems somehow remote and unreal. Here we are relaxing over drinks and smokes while at any moment, you tell us, the entire scene is due to vanish in an almighty explosion—and us with it. Are you absolutely certain there can be no mistake?"

"I've only the evidence you've seen, but it's conclusive enough for me. Remember, if I've detected one nova, I've detected dozens. All I can say is, it's never failed yet!"

"I still can't take the idea in," insisted Darlington.

"Neither can I," I confessed. "To me it's inconceivable that in one mad moment centuries of human endeavour are to be wiped out for ever, blindly, without reason and without trace."

"Come!" said Garwood, who is something of a cynic. "You can't believe it because you don't *want* to believe it. I've had all day to think about it, and I've got used to the idea, though it was quite a shock at first. In fact, on reflection I've come to the conclusion that it may not be a bad thing. All human endeavour is destined ultimately to be in vain, for the Solar System can't go on for ever. Some day in the astronomically near future it's bound to crack up, if not from one cause then from another. And if eventually, why not now?"

"As for the alleged progress of man, what is it? A never-ending scramble to invent bigger and better methods of exterminating himself! And why? Because of his innate greed and stupidity. Good riddance, say I!"

We drank, but not without protest from Darlington.

"The world's all right," he maintained, "and so are most of the people in it. It's the selfish, ambitious and unscrupulous few who cause the trouble, all the time."

"A touching theory, Darlington," smiled Garwood. "But what could those few do if the many were not prepared to follow them? No, my friend. Sound a drum, blow a bugle, and thrust a gun into the hands of the average specimen of *homo* so-called *sapiens*, and he'll shoot just when and where he's ordered, with no questions asked—or, indeed, permitted."

"You've not told anyone else of your discovery?" I put in deftly, in an effort to switch them to some subject other than the manifest imperfections of man.

"Not a word to a soul."

"Why not?" Darlington demanded. "It would be the greatest discovery of all time. Just imagine the headlines—!"

"Quite!" responded Garwood. "If there's one belief to which I've always clung, it's that those who imagine they've discovered the coming end of the world should keep it to themselves or at least confine it to a small and intimate circle of friends. What have I to gain by sounding the alarm? What has anyone to gain? Precisely nothing. For one thing, there's insufficient time for the prediction to be considered seriously and subjected to proper investigation by those who would require such proof as I can offer. And for another, even if there were time to convince everybody, my very triumph would encompass my end!"

"I see your point," conceded Darlington. "So we're the only living persons in the know?"

"That is so. I hope you'll forgive me for dragging you into this, but I felt I just couldn't sit it out alone!"

I looked at my watch. "It's after 2 a.m. How much longer do you think we shall have to wait?"

"I can't say within an hour or two, but probably not much longer now. Another cigar? Some more whiskey?"

We had another cigar. And more to drink. And then more again. Garwood's stocks of both tobacco and alcohol seemed unlimited as his hospitality, and I had vague recollections that we grew quite sentimental towards the end. The recollection, however, is exceedingly vague. For it is with the utmost regret that I have to record that the dawn which

was destined not to be, but which came nevertheless, found the three of us alcoholically saturated and completely oblivious to our surroundings. In brief, we were dead drunk.

To our eternal disgrace, it was Garwood's housekeeper who found us, and a fine time she must have had bringing us round. But strong and frequent doses of black coffee finally sobered us up, and by noon we were sufficiently ourselves to realise that Garwood's spectacular prediction had somehow gone amiss. Not much was said at the time; least of all by Garwood. And when, late that afternoon, Darlington and I set off on our return journey, it seemed to me that we left behind a sadly disappointed man.

I WAS ROUSED the next morning by a telephone call, at the ungodly hour of 8.30.

"Yes?" I inquired, not half awake. "Darlington here. Have you seen the morning papers?"

He sounded highly excited, and before I could reply that I was not in the habit of reading in my sleep, went on: "The news has just been released. Too big to suppress, though they kept it dark as long as they could on this side. Happened the day before yesterday..."

"Do you mind telling me," I asked politely, "just what the devil you're babbling about?"

"Listen!" he said. "I'll read you some of the headlines. . . . BIGGEST DISASTER SINCE THE FLOOD . . . MILLIONS DEAD AND DYING

IN 100,000-SQUARE-MILE AREA OF DEVASTATION . . . CRATER TWO MILES DEEP . . . 'The Devil's Work,' Says President . . . 'God Has Spoken'—Bishop of Topeka . . . Bereaved Mother's Warning Dream . . . Sharp Fall in Uranium Consolidated—"

"Just a minute!" I begged. My brain was reeling.

Darlington seemed hurt. "You don't get it?" he asked, his tone incredulous.

"I do not. I don't get any sleep either. And I've only just got over a thick head—remember?"

I heard him give a deep sigh. Then: "Those headlines are all about the greatest man-made explosion that ever happened. The uranium extraction plant at Oakridge, Tennessee—the whole lot of it—went sky-high. *Whoooooph!* Just like that! Can you get that into your whiskey-sodden head?"

"You mean—?"

"I do! The explosion occurred, without the slightest warning, the day before yesterday—the day that Garwood's instrument picked up and recorded those sub-atomic trigger reactions of his!"

"So—so that was it!"

"Precisely. That was a local effect he *didn't* block. It wasn't the end of the world, but it was the end of quite a large piece of it." He chuckled. "What do you say we go over and see the old cynic? It's hardly the sort of thing that calls for a celebration, but I think we owe him something in the nature of an apology. Besides, I'm very fond of cold chicken..."

THE END

---

## THINGS TO COME

# SURVIVAL

by Norman Lazenby

*A story of Time-travel—of a daring jaunt into the remote past, to an age when monsters ruled the Earth. But the text-books only tell us of those frightful reptiles. . . .*

In the next issue of FANTASY



# The Worlds of If

By STANLEY G. WEINBAUM

*To travel into the future or the past? Pfui! But to explore the might-have-been—that was easy to a genius like van Manderpootz.*

I STOPPED on the way to Staten Airport to call up, and that was a mistake since I had a chance of making it otherwise. But the office was affable.

"We'll hold the ship five minutes for you," the clerk said. "That's the best we can do." So I rushed back to my taxi and we spun off to the third level and sped across the Staten Bridge like a comet treading a steel rainbow.

I had to be in Moscow by evening for the opening of bids on the Ural Tunnel. The Government required the personal presence of an agent of each bidder; but the firm should have known better than to send me, even though the N. J. Wells Corporation is, so to speak, my father.

I have an undeserved reputation for being late for everything; something always comes up to prevent me from getting anywhere on time. It's never *my* fault.

This time it was a chance encounter with my old physics professor, old Haskel van Manderpootz. I couldn't very well just say "hello" and "good-bye" to him; I'd been a favourite of his back in the college days of 1914. And I missed the air liner, of course. I was still on the Staten Bridge when I heard the roar of the catapult and the Soviet rocket *Baikal* hummed over us like a tracer bullet with a long tail of flame.

We got the contract anyway. The firm



wired our man in Beirut and he flew up to Moscow. But it didn't help my reputation. However, I felt a great deal better when I saw the evening papers. The *Baikal*, flying at the north edge of the eastbound lane to avoid a storm, had locked wings with a British fruitship and all but a hundred of her five hundred passengers were lost. I had almost become "the late Dixon Wells" in a grimmer sense.

I'd made an engagement for the following week with old van Manderpootz. It seems he'd transferred to New York University as head of the department of Newer Physics—that is, of Relativity. He deserved it; the old chap was a genius if ever there was one. Even now, eight years out of college, I remember more from his course than from half a dozen other hazards on the path to an engineer's education. So on Tuesday night I dropped in—an hour or so late, to tell the truth, since I'd forgotten about the engagement until mid-evening. He was reading, in a room as disorderly as ever.

"Humph!" he grunted. "Time changes everything but habit, I see. You were a good student, Dick, but I seem to recall that you always arrived in class toward the middle of the lecture."

"I had a course in East Hall just before," I explained. "I couldn't seem to make it in time."

"Well, it's time you learned to be on time," he growled. Then his eyes twinkled. "Time!" he ejaculated. "The most fascinating word in the language. Here we've used it five times (there goes the sixth time—and the seventh!) in the first minute of conversation. Each of us understands the other, yet science is just beginning to learn its meaning. Science? I mean that *I* am beginning to learn."

I sat down. "You and science are synonymous," I grinned. "Aren't you one of the world's outstanding physicists?"

"One of them!" he snorted. "One of them, eh! And who are the others?"

"Oh, Corveille and Hastings and Shrimski—"

"Bah! Would you mention them in the same breath with the name of

van Manderpootz? A pack of jackals, eating the crumbs of ideas that drop from my feast of thoughts! Had you gone back into the last century, now—had you mentioned Einstein and de Sitter—there, perhaps, are names worthy to rank with (or just below) van Manderpootz!"

I grinned again in amusement. "Einstein is considered pretty good, isn't he?" I remarked. "After all, he was the first to tie time and space to the laboratory. Before him they were just philosophical concepts."

"He didn't!" rasped the Professor. "Perhaps in a dim, primitive fashion he showed the way, but I—I, van Manderpootz—am the first to seize time, drag it into my laboratory and perform an experiment on it."

"Indeed! And what sort of experiment?"

"What experiment other than simple measurement is it possible to perform?" he snapped.

"Why—I don't know. To travel in it?"

"Exactly."

"Like these time machines that are so popular in the magazines? To go into the future or the past?"

"Bah! Many bahs! The future or the past—pfui! It needs no van Manderpootz to see the fallacy in that. Einstein showed us that much."

"How? It's conceivable, isn't it?"

"Conceivable? And you, Dixon Wells, studied under van Manderpootz!" He grew red with emotion, then grimly calm. "Listen to me. You know how time varies with the speed of a system—Einstein's relativity?"

"Yes."

"Very well. Now suppose that the great engineer Dixon Wells invents a machine capable of travelling very fast, enormously fast, nine-tenths as fast as light. Do you follow? Good. You then fuel this miracle ship for a little jaunt of a half million miles which, since mass (and with it inertia) increases according to the Einstein formula with increasing speed, takes all the fuel in the world. But you solve that. You use atomic energy. Then, since at nine-tenths light-speed your ship weighs about as much as the Sun you

disintegrate North America to give you sufficient motive power. You start off at that speed, a hundred and sixty-eight thousand miles per second, and you travel for two hundred and four thousand miles. The acceleration has now crushed you to death, but you have penetrated the future." He paused, grinning sardonically. "Haven't you?"

"Yes."

"And how far?"

I hesitated.

"Use your Einstein formula!" he screeched. "How far? I'll tell you. *One second!*" He grinned triumphantly. "That's how possible it is to travel into the future. And as for the past—in the first place you'd have to exceed light-speed which immediately entails the use of more than an infinite number of horse-powers. We'll assume that the great engineer Dixon Wells solves that little problem too, even though the energy output of the whole universe is not an infinite number of horse-powers. Then he applies this more than infinite power to travel at two hundred and four thousand miles per second for *ten* seconds. He has then penetrated the past. How far?"

Again I hesitated.

"I'll tell you. *One second!*" He glared at me. "Now all you have to do is to design such a machine, and then van Manderpootz will admit the possibility of travelling into the future—for a limited number of seconds. As for the past, I have just explained that all the energy in the universe is insufficient for that."

"But," I stammered, "you just said that you—"

"I did *not* say anything about travelling into either future or past, which I have just demonstrated to you to be impossible—a practical impossibility in the one case and an absolute one in the other."

"Then how *do* you travel in time?"

"Not even van Manderpootz can perform the impossible," said the Professor, now faintly jovial. He tapped a thick pad of typewriter paper on the table beside him. "See, Dick, this is the world, the universe." He swept a finger down it. "It is long in time and"—sweeping his hand across—"it is

broad in space, but"—now jabbing his finger against its centre—"it is very thin in the fourth dimension. Van Manderpootz takes always the shortest, most logical course. I do not travel *along* time, into past or future. No. Me, I travel *across* time, sideways!"

I gulped. "Sideways into time! What's there?"

"What would naturally be there?" he snorted. "Ahead is the future; behind is the past. Those are real, the worlds of past and future. What worlds are neither past nor future, but contemporary and yet extemporal—existing, as it were, in time parallel to our time?"

I shook my head.

"Idiot!" he snapped. "The conditional worlds, of course! The worlds of 'if.' Ahead are the worlds to be; behind are the worlds that were; to either side are the worlds that might have been—the worlds of 'if'!"

"Eh?" I was puzzled. "Do you mean that you can see what will happen if I do such and such?"

"No!" he snorted. "My machine does not reveal the past nor predict the future. It will show, as I told you, the conditional worlds. You might express it by: 'if I had done such and such, so and so would have happened.' The worlds of the subjunctive mood."

"Now how the devil does it do that?"

"Simple, for van Manderpootz! I use polarised light, polarised not in the horizontal or vertical planes but in the direction of the fourth dimension—an easy matter. One uses Iceland spar under colossal pressures, that is all. And since the worlds are very thin in the direction of the fourth dimension, the thickness of a single light wave, though it be but millionths of an inch, is sufficient. A considerable improvement over time-travelling in past or future, with its impossible velocities and ridiculous distances!"

"But—are those—worlds of 'if'—real?"

"Real? What is real? They are real, perhaps, in the sense that two is a real number as opposed to the square root of minus two, which is imaginary. They are the worlds that would have been *if*—Do you see?"

I nodded. "Dimly. You could see, for instance, what New York would have been like if England had won the Revolution instead of the Colonies."

"That's the principle, true enough. But you couldn't see that on the machine. Part of it, you see, is a Horsten psychomat (stolen from one of my ideas, by the way), and you, the user, become part of the device. Your own mind is necessary to furnish the background. For instance, if George Washington could have used the mechanism after the signing of peace he could have seen what you suggest. We can't. You can't even see what would have happened if I hadn't invented the thing, but I can. Do you understand?"

"Of course. You mean the background has to rest in the past experiences of the user."

"You're growing brilliant," he scoffed. "Yes. The device will show ten hours of what would have happened if—condensed, of course, as in a movie, to half an hour's actual time."

"Say, that sounds interesting!"

"You'd like to see it? Is there anything you'd like to find out—any choice you'd alter?"

"I'll say—a thousand of 'em! I'd like to know what would have happened if I'd sold out my stocks in 2009 instead of '10. I was a millionaire in my own right then, but I was a little—well, a little late in liquidating."

"As usual," remarked van Manderpootz. "Let's go over to the laboratory."

THE PROFESSOR'S quarters were but a block from the campus. He ushered me into the Physics Building and thence into his own research laboratory, much like the one I had visited during my courses under him. The device—he called it his "Subjunctivisor," since it operated in hypothetical worlds—occupied the centre table. Most of it was merely a Horsten psychomat, but glittering crystalline and glassy was the prism of Iceland spar, the polarising agent that was the heart of the instrument.

Van Manderpootz pointed to the headpiece. "Put it on," he said, and I sat staring at the screen of the psychomat.

I suppose everyone is familiar with the Horsten psychomat; it was as much a fad a few years ago as the ouija board a century back. Yet it isn't just a toy. Sometimes, much as the ouija board, it's a real aid to memory. A maze of vague and coloured shadows is caused to drift slowly across the screen, and one watches them, meanwhile visualising whatever scene or circumstances he is trying to remember. He turns a knob which alters the arrangement of lights and shadows, and when by chance the design corresponds to his mental picture, presto! there is his scene re-created under his eyes.

Of course, his own mind adds the details. All the screen actually shows are those tinted blobs of light and shadow, but the thing can be amazingly real. I've seen occasions when I could have sworn the psychomat showed pictures almost as sharp and detailed as reality itself; the illusion is sometimes as startling as that.

Van Manderpootz switched on the light, and the play of shadows began. "Now recall the circumstances of, say, a half-year after the market crash. Turn the knob until the picture clears, then stop. At that point I direct the light of the Subjunctivisor upon the screen, and you have nothing more to do than watch."

I did as he directed. Momentary pictures formed and vanished. The inchoate sounds of the device hummed like distant voices, but without the added suggestion of the picture they meant nothing. My own face flashed and dissolved and then, finally, I had it. There was a picture of myself sitting in an ill-defined room; that was all. I released the knob and gestured.

A click followed. The light dimmed, then brightened. The picture cleared and, amazingly, another figure emerged—a woman. I recognised her. It was Whimsy White, erstwhile star of television and premiere of the Vision Varieties of '09. She was changed in that picture, but I recognised her.

I'll say I did! I'd been trailing her all through the boom years of '07 to '10, trying to marry her, while old N. J. raved and ranted and threatened to leave

everything to the Society for Rehabilitation of the Gobi Desert. I think those threats were what kept her from accepting me, but after I took my own money and ran it up to a couple of million in that crazy market of '08 and '09, she softened.

Temporarily, that is. When the crash of the spring of '10 came and bounced me back on my father and into the firm of N. J. Wells, her favour dropped a dozen points to the market's one. In February we were engaged, in April we were hardly speaking. In May they sold me out. I'd been late again.

And now there she was on the psychomaton screen, obviously plumping out, and not nearly so pretty as memory had pictured her. She was staring at me with an expression of enmity, and I was glaring back. The buzzes became voices.

"You nit-wit!" she snapped. "You can't bury me out here. I want to go back to New York where there's a little life. I'm bored with you and your golf."

"And I'm bored with you and your whole dizzy crowd."

"At least they're alive. You're a walking corpse. Just because you were lucky enough to gamble yourself into the money, you think you're a tin god."

"Well, I *don't* think you're Cleopatra! Those friends of yours—they trail after you because you give parties and spend money—my money."

"Better than spending it to knock a white walnut along a mountainside!"

"Indeed? You ought to try it, Marie." (That was her real name.) "It might help your figure—though I doubt if anything could!"

She glared in rage and—well, that was a painful half-hour. I won't give all the details, but I was glad when the screen dissolved into meaningless coloured clouds.

"Whew!" I said, staring at van Manderpootz, who had been reading.

"You liked it?"

"Liked it! I guess I was lucky to be cleaned out. I won't regret it from now on."

"That," said the Professor grandly, "is van Manderpootz's great contribution to human happiness. 'Of all sad words of tongue or pen, the saddest are these:

It might have been.' True no longer, my friend. Van Manderpootz has shown that the proper reading is 'It might have been—worse!'"

IT WAS VERY late when I returned home, and as a result very late when I rose, and equally late when I got to the office. My father was unnecessarily worked up about it, but he exaggerated when he said I'd never been on time. He forgets the occasions when he's awakened me and dragged me down with him. Nor was it necessary to refer so sarcastically to my missing the *Baikal*. I reminded him of the wrecking of the liner, and he responded very heartlessly that if I'd been aboard the rocket would have been late and so would have missed colliding with the fruitship. It was likewise superfluous for him to mention that when he and I had tried to snatch a few weeks of golfing in the mountains, even the spring had been late. I had nothing to do with that.

"Dixon," he concluded, "you have no conception whatever of time. None whatever."

The conversation with van Manderpootz recurred to me. I was impelled to ask: "And have you, sir?"

"I have," he said grimly. "I most assuredly have. Time," he said oracularly, "is money."

You can't argue with a viewpoint like that. But those aspersions of his rankled, especially that about the *Baikal*. Tardy I might be, but it was hardly conceivable that my presence aboard the rocket could have averted the catastrophe. It irritated me; in a way, it made me responsible for the deaths of those unrescued hundreds among the passengers and crew, and I didn't like the thought. Of course, if they'd waited an extra five minutes for me, or if I'd been on time and they'd left on schedule instead of five minutes late, or if—if—if!

If! The word called up van Manderpootz and his Subjunctivisor—the worlds of "if," the weird, unreal worlds that existed beside reality, neither past nor future, but contemporary, yet eternal. Somewhere among their ghostly infinities existed one that represented the world that would have been had I made

the liner. I had only to call up van Manderpootz, make an appointment, and find out.

Yet it wasn't an easy decision. Suppose—just suppose that I found myself responsible. Not legally responsible, certainly; there'd be no question of criminal negligence or anything of that sort. Not even morally responsible; because I couldn't possibly have anticipated that my presence or absence could weigh so heavily in the scales of life and death, nor could I have known in which direction the scales would tip. Just—responsible, that was all. Yet I hated to find out.

I hated equally not finding out. Uncertainty has its pangs too, quite as painful as those of remorse. It might be less nerve-racking to know myself responsible than to wonder, to waste thoughts in vain doubts and futile reproaches. So I seized the visiphone, dialled the number of the University, and at length gazed on the broad, humorous, intelligent features of van Manderpootz, dragged from a lecture by my call.

I WAS ALL but prompt for the appointment the following evening, and might have been actually on time but for an unreasonable traffic officer who insisted on booking me for speeding. At any rate, van Manderpootz was impressed.

"Well!" he rumbled. "I almost missed you, Dixon. I was just going over to the club, since I didn't expect you for an hour. You're only ten minutes late."

I ignored this. "Professor, I want to use your—uh—Subjunctivisor."

"Eh? Oh, yes. You're lucky then. I was just about to dismantle it."

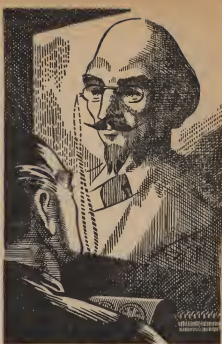
"Dismantle it? Why?"

"It has served its purpose. It has given birth to an idea far more important than itself. I shall need the space it occupies."

"But what is the idea, if it's not too presumptuous of me to ask?"

"It is not too presumptuous. You and the world which awaits it so eagerly may both know, but you hear it from the lips of the author. It is nothing less than the autobiography of van Manderpootz!" He paused impressively.

THE WORLDS OF IF



I gaped. "Your autobiography?"

"Yes. The world, though perhaps unaware, is crying for it. I shall detail my life, my work. I shall reveal myself as the man responsible for the three years' duration of the Pacific War of 2004."

"You?"

"None other. Had I not been a loyal Netherlands subject at that time, and therefore neutral, the forces of Asia would have been crushed in three months instead of three years. The Subjunctivisor tells me so. I would have invented a calculator to forecast the chances of every engagement—van Manderpootz would have removed the hit or miss element in the conduct of war." He frowned solemnly. "There is my idea. The autobiography of van Manderpootz. What do you think of it?"

I recovered my thoughts. "It's—uh—it's colossal!" I said vehemently. "I'll buy a copy myself. Several copies. I'll send 'em to my friends."

"I," said van Manderpootz expansively, "shall autograph your copy for you. It will be priceless. I shall write in some fitting phrase, perhaps something like *Magnificus sed non superbus*—'Great but not proud!' That well describes van Manderpootz, who despite his greatness is simple, modest and unassuming. Don't you agree?"

"Perfectly! A very apt description of you. But—couldn't I see your Subjunctivisor before it's dismantled to make way for the greater work?"

"Ah! You wish to find out something?"

"Yes, Professor. Do you remember the *Baikal* disaster of a week or two ago? I was to have taken that liner to Moscow. I just missed it." I related the circumstances.

"Humph!" he grunted. "You wish to discover what would have happened had you caught it, eh? Well, I see several possibilities. Among the worlds of 'if' is the one that would have been real if you had been on time, the one that depended on the vessel waiting for your actual arrival, and the one that hung on your arriving within the five minutes they actually waited. In which are you interested?"

"Oh—the last one." That seemed the likeliest. After all, it was too much to expect that Dixon Wells could ever be on time, and as to the second possibility—well, they *hadn't* waited for me, and that, in a way, removed the weight of responsibility.

"Come on," rumbled van Manderpootz.

I followed him across to the Physics Building and into his littered laboratory. The device still stood on the table and I took my place before it, staring at the screen of the Horsten psychomat. The clouds wavered and shifted as I sought to impress my memories on their suggestive shapes, to read into them some picture of that vanished morning. Then I had it. I made out the vista from the Staten Bridge, and was speeding across the giant span toward the airport. I waved a signal to van Manderpootz, the thing clicked, and the Subjunctivisor was on.

The grassless clay of the field appeared.

It is a curious thing about the psychomat that you see not only through your own eyes but also through the eyes of your image on the screen. It lends a strange reality to the working of the toy; I suppose a sort of self-hypnosis is partly responsible. I was rushing over the ground toward the glittering, silver-winged projectile that was the *Baikal*. A glowering officer waved me on, and I dashed up the slant of the gangplank and into the ship. The port dropped and I heaved a long "Whew!" of relief.

"Sit down!" barked the officer, gesturing towards an unoccupied seat. I fell into it; the ship quivered under the thrust of the catapult, grated harshly into motion, and then was flung bodily into the air. The blasts roared instantly, then settled to a more muffled throbbing, and I watched Staten Island drop down and slide back beneath me. The giant rocket was under way.

"Whew!" I breathed again. "Made it!"

I caught an amused glance from my right. I was in an aisle seat; there was no one to my left, so I turned, glanced, and froze staring.

It was a girl. Perhaps she wasn't actually as lovely as she looked to me; after all, I was seeing her through the half-visionary screen of the psychomat. I've told myself since that she *couldn't* have been so pretty as she seemed, that it was due to my own imagination filling in the details. I don't know; I remember only that I stared at curiously lovely silver-blue eyes and velvety brown hair, a small, amused mouth and an impudent nose. I kept staring until she flushed.

"I'm sorry," I said quickly. "I—was startled."

THERE'S A friendly atmosphere aboard a trans-oceanic rocket. The passengers are forced into a crowded intimacy for anywhere from seven to twelve hours, and there isn't much room for moving about. Generally one strikes up an acquaintance with his neighbours; introductions aren't at all necessary, and the custom is simply to speak to anybody you choose—something like an all-day trip on the railroad trains of the last

century, I suppose. You make friends for the duration of the journey and then, nine times out of ten, you never hear of your travelling companions again.

The girl smiled. "Are you the individual responsible for the delay in starting?"

I admitted it. "I seem to be chronically late. Even watches lose time as soon as I wear them."

She laughed. "Your responsibilities can't be very heavy."

Well, they weren't, of course, though it's surprising how many clubs, caddies and chorus girls have depended on me at various times for appreciable portions of their incomes. But somehow I didn't feel like mentioning those things to the silvery-eyed girl.

We talked. Her name, it developed, was Joanna Caldwell, and she was going as far as Paris. She was an artist, or hoped to be one day, and of course there is no place in the world that can supply both training and inspiration like Paris. So it was there she was bound for a year of study; and despite her demurely humorous lips and laughing eyes, I could see that the business was of vast importance to her. I gathered that she had worked hard for the year in Paris, had scraped and saved for three years as fashion illustrator for some woman's magazine, though she couldn't have been many months over twenty-one. Her painting meant a great deal to her, and I could understand it. I'd felt that way about polo once.

So you see, we were sympathetic spirits from the beginning. I knew that she liked me, and it was obvious that she didn't connect Dixon Wells with the N. J. Wells Corporation. As for me—well, after that first glance into her cool, silver eyes I simply didn't care to look anywhere else. The hours seemed to drip away like minutes while I watched her.

You know how these things go. Suddenly I was calling her Joanna and she was calling me Dick, and it seemed as if we'd been doing just that all our lives. I'd decided to stop over in Paris on my way back from Moscow, and I'd secured her promise to let me see her. She was different, I tell you. She was nothing like

the calculating Whimsy White, and still less like the dancing, simpering, giddy youngsters one meets at social affairs. She was just Joanna, cool and humorous yet sympathetic and serious, and as pretty as a Majolica figurine.

We could scarcely realise it when the steward passed along to take orders for luncheon. Four hours out? It seemed like forty minutes. And we had a pleasant feeling of intimacy in the discovery that both of us liked lobster salad and detested oysters. It was another bond. I told her whimsically that it was an omen, nor did she object to considering it so.

Afterwards we walked along the narrow aisle to the glassed-in observation room up forward. It was almost too crowded for entry, but we didn't mind that at all as it forced us to sit very close together. We stayed long after both of us had begun to notice the stuffiness of the air.

It was just after we had returned to our seats that the catastrophe occurred. There was no warning save a sudden lurch, the result, I suppose, of the pilot's futile last-minute attempt to swerve—just that, and then a grinding crash and a terrible sensation of spinning. And after that a chorus of shrieks that were like the sounds of battle.

It was battle. Five hundred people were picking themselves up from the floor, were trampling each other, milling around, being cast helplessly down as the great rocket-plane, its left wing but a broken stub, circled down towards the Atlantic.

The shouts of officers sounded and a loudspeaker blared. "Be calm," it kept repeating, and then: "There has been a collision. We have contacted a surface ship. There is no danger—There is no danger—"

I struggled up from the debris of shattered seats. Joanna was gone. Just as I found her crumpled between the rows, the ship struck the water with a jar that set everything crashing again. The speaker blared: "Put on the cork belts under the seats. The lifebelts are under the seats."

I dragged a belt loose and snapped it around Joanna, then donned one myself. The crowd was surging forward now, and the tail end of the ship began to drop.

There was water behind us, sloshing in the darkness as the lights went out. An officer came sliding by, stooped, and fastened a belt about an unconscious woman ahead of us. "You all right?" he yelled, and passed on without waiting for an answer.

The speaker must have been cut in to a battery circuit. "And get as far away as possible," it ordered suddenly. "Jump from the forward port and get as far away as possible. A ship is standing by. You will be picked up. Jump from the—" It went dead again.

I got Joanna untangled from the wreckage. She was pale; her silvery eyes were closed. I started dragging her slowly and painfully towards the forward port, and the slant of the floor increased until it was like the slide of a ski-jump. The officer passed again. "Can you handle her?" he asked, and again he dashed away.

I was getting there. The crowd around the port looked smaller, or was it simply huddling closer? Then suddenly a wail of fear and despair went up, and there was a roar of water. The observation room walls had given. I saw the green surge of waves and a billowing deluge rushed down upon us. I had been late again.

That was all. I raised shocked and frightened eyes from the subjunctivisor to face van Manderpootz, who was scribbling on the edge of the table.

"Well?" he asked.

I shuddered. "Horrible!" I murmured. "We—I guess we wouldn't have been among the survivors."

"We, eh? *We*?" His eyes twinkled.

I did not enlighten him. I thanked him, bade him good-night, and went dolorously home.

EVEN MY FATHER noticed something queer about me. The day I got to the office only five minutes late, he called me in for some anxious questioning as to my health. I couldn't tell him anything, of course. How could I explain that I'd been late once too often, and had fallen in love with a girl two weeks after she was dead?

The thought drove me nearly crazy. Joanna! Joanna with her silvery eyes

now lay somewhere at the bottom of the Atlantic. I went around half dazed, scarcely speaking. One night I actually lacked the energy to go home and sat smoking in my father's big, overstuffed chair in his private office until I finally dozed off. The next morning, when old N. J. entered and found me there before him, he turned pale as paper, staggered and gasped, "My heart!" It took a lot of explaining to convince him that I wasn't early at the office but just very late going home.

At last I felt I couldn't stand it. I had to do something—anything at all. I thought finally of the Subjunctivisor. I could see—yes, I could see what would have transpired if the ship hadn't been wrecked! I could trace out that weird, unreal romance hidden somewhere in the worlds of "if." I could, perhaps, wring a sombre, vicarious joy from the things that might have been. I could see Joanna once more!

It was late afternoon when I rushed over to van Manderpootz's quarters. He wasn't there. I encountered him finally in the hall of the Physics Building.

"Dick!" he exclaimed. "Are you sick?"

"Sick? No, not physically. Professor, I've got to use your Subjunctivisor again. I've got to!"

"Eh? Oh!—that toy! You're too late, Dick. I've dismantled it. I have a better use for the space."

I gave a miserable groan and was tempted to damn the autobiography of the great van Manderpootz. A gleam of sympathy showed in his eyes, and he took my arm, dragging me into the little office adjoining his laboratory.

"Tell me," he commanded.

I did. I guess I made the tragedy plain enough, for his heavy brows knit in a frown of pity.

"Not even van Manderpootz can bring back the dead," he murmured. "I'm sorry, Dick. Take your mind from the affair. Even were my Subjunctivisor available, I wouldn't permit you to use it. That would be but to turn the knife in the wound." He paused. "Find something else to occupy your mind. Do as van Manderpootz does. Find forgetfulness in work."



"Yes," I responded dully. "But who'd want to read *my* autobiography? That's all right for you."

"Autobiography? Oh! I remember. No, I have abandoned that. History itself will record the life and works of van Manderpootz. Now I am engaged on a far grander project."

"Indeed?" I was utterly, gloomily disinterested.

"Yes. Gogli has been here, Gogli the sculptor. He is to make a bust of me. What better legacy can I leave to the world than a bust of van Manderpootz, sculptured from life? Perhaps I shall present it to the city, perhaps to the university. I would have given it to the Royal Society if they had been a little more receptive, if they—if—if!" This last in a shout.

"Huh?"

"If!" cried van Manderpootz. "What you saw in the Subjunctivisor was what would have happened *if* you had caught the ship!"

"I know that."

"But something quite different might have really happened! Don't you see? She—she—Where are those old newspapers?"

He was pawing through a pile of them. He flourished one finally. "Here! Here are the survivors!"

Like letters of flame Joanna Caldwell's name leaped out at me. There was even a little paragraph about it, as I saw once

my reeling brain permitted me to read:

"At least a score of survivors owe their lives to the bravery of twenty-eight year old Navigator Orris Hope, who patrolled both aisles during the panic, lacing lifebelts on the injured and helpless and carrying many to the port. He remained on the sinking liner until the last, finally fighting his way to the surface through the broken walls of the observation room. Amongst those who owe their lives to the young officer are: Patrick Owensby, New York City; Mrs. Campbell Warren, Boston; Miss Joanna Caldwell, New York City—"

I suppose my shout of joy was heard over in the Administration Building, blocks away. I didn't care. If van Manderpootz hadn't been armoured in stubby whiskers, I'd have kissed him. Perhaps I did anyway: I can't be sure of my actions during those chaotic minutes in the Professor's tiny office.

At last I calmed. "I can look her up!" I gloated. "She must have landed with the other survivors, and they were all on the British tramp freighter, the *Osgood*, that docked here last week. She must be in New York—and if she's gone over to Paris I'll find out and follow her!"

WELL, IT'S A queer ending. She *was* in New York, but—you see, Dixon Wells had, so to speak, known Joanna Caldwell by means of the Subjunctivisor, but Joanna had never known Dixon Wells. What the ending might have been if—if—

But it wasn't. She had married Orris Hope, the young officer who had rescued her. I was late again.

THE END.

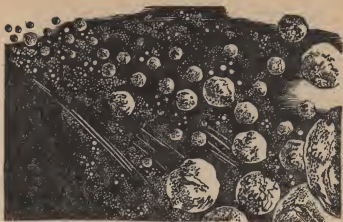
---

## IN THE NEXT ISSUE

# HAUNTED HOUSE

by J. Austin Jackson

*Suppose you built yourself a house—an ultra-modern one, thoroughly scientific and streamlined. You wouldn't expect it to harbour a ghost, would you?*



# Lost Planet

By GEOFFREY GILES

*An astronomical jigsaw puzzle with fifty thousand pieces . . . pieces of a world that blew up. We'll salvage that wreckage one day!*

IN THE 340,000,000 mile belt of space between the orbits of Mars and Jupiter revolve some thousands of miniature worlds ranging from golf-ball size to nearly 500 miles in diameter. How they came to be there is one of the major mysteries of astronomy.

One view is that they are the debris of a huge comet which once passed through the Solar System, was captured by giant Jupiter and forced to revolve around the Sun until all that remained of its former glory was the bits and pieces we call the Asteroids. A second theory is that they are the remnants of the material which went to make the Solar System, thrown off by the Sun and prevented by Jupiter's gravitational influence from coalescing in a mass which might have become another planet of respectable dimensions.

A third, more fascinating notion is that they *were* once a planet which broke into pieces ages ago in a tremendous explosion, or a series of them, caused by excessive radioactivity in its core. A world that blew itself up . . .

Since Ceres, the largest of these midget worlds, was spotted by the Italian astronomer Piazzi in 1801, some 1,200 of them have been observed, but it is estimated that as many as 50,000 actually exist. The telescopic camera has multiplied by four the number of previous discoveries, and recent improvements in the method of photographic detection promise not only to increase the count but to confirm the latest theory that the bigger planetoids may have satellites.

It is feasible that those of greater

mass might attract the smaller bodies into regular orbits around them, making them tiny moons, just as Jupiter is believed to have drawn several of the larger ones into his clutches. And even Mars is not above suspicion of having acquired his two diminutive satellites, Phobos and Deimos, in that way.

THE ORBITS of some Asteroids are so eccentric that they intersect the Earth's and occasionally bring them very close to us. Little, one-mile-diameter Hermes broke all records a few years back when he ventured within 485,000 miles of our perturbed planet. But Luna need fear no rival and the anxious can sleep soundly in their beds. For Earth is hardly massive enough to capture any of those bold but speedy spirits, and the possibility of collision is remote.

Up to now, these so-called "vermin of the sky" have been of use only to astronomers in checking up on their measurements and keeping them ever on the alert. The search for more minor planets is with them an absorbing pastime, revealing some 200 new discoveries every year; though with all their vigilance there are some that get lost. The American discoverer of twenty-nine planetoids went so far as to leave his surviving colleagues a bequest in his will with the proviso that they should keep a constant eye on his elusive finds.

But in time to come, if we are to believe the hopeful advocates of space-flight, man may actually set foot on those pocket-size planets, using them as stepping stones in his travels through the interplanetary gulfs; may even control their erratic paths, shift them entirely out of their orbits and transfer them to regions where they will be most useful as "space stations," millions of miles away from their present crowded situation. He may find in them, too, easily accessible mineral resources to aid

him in his spatial projects. And perhaps traces of the civilisation which existed, eons ago, on the planet of which they are the scattered fragments.

FOR THE OLD Lost Planet hypothesis of the Asteroid's origin, first advanced in the early days of their discovery, only to be discarded when a systematic comparison of their muddled orbits failed to produce any evidence to support it, is now coming back into favour as the most likely explanation of their tantalising mysteries. The more we learn, the more plausible the most "fantastic" theory becomes. For instance, there's the matter of Vesta's peculiar brilliance.

This third biggest of the Asteroids, 240 miles across, shines with a light more intense than that of our own Moon or even of the planet Venus with her dense, cloudy atmosphere. This high *albedo* is one of the puzzles astronomers can't account for, while denying the possibility of any of these wee worlds having mass enough to retain an atmosphere or even a coating of ice.

The only possible solution is that Vesta consists of quartz crystals or white rock with great reflective power. And since it is most unlikely that a mass comprising such a limited number of elements should have been thrown off by the Sun in the first place, the fact of Vesta's brilliance is considered to enhance the idea of the exploded planet.

If such a world existed, its size would have been rather less than that of Earth, and in view of its distance from the Sun it would have cooled and become habitable long before this planet. If the examination of meteors originating in the Asteroid Belt is any indication, its disruption must have occurred comparatively recently, astronomically speaking. Before that, it may have harboured life—intelligent life, which has left its mark somewhere among those bits and pieces of the world that was. When we salvage those remains . . .

THE END



# Technical Error

By ARTHUR C. CLARKE

*The Chief Physicist had a problem . . . How to keep a starving man alive when it would cost two millions a year to feed him!*

IT WAS ONE of those accidents for which no one could be blamed. Richard Nelson had been in and out of the generator pit a dozen times, taking temperature readings to make sure that the unearthly chill of liquid helium was not seeping through the insulation. This was the first generator in the world to use the principle of superconductivity. The windings of the immense stator had been immersed in a helium bath, and the miles of wire now had a resistance too small to be measured by any means known to man.

Nelson noted with satisfaction that the temperature had not fallen further than

they expected. The insulation was doing its work; it would be safe to lower the rotor into the pit. That thousand-ton cylinder was now hanging fifty feet above Nelson's head, like the business end of a mammoth drop hammer. He and everyone else in the power station would feel much happier when it had been lowered on to its bearings and keyed into the turbine shaft.

Nelson put away his notebook and started to walk towards the ladder. At the geometric centre of the pit, he made his appointment with destiny.

The load on the power network had been steadily increasing for the last hour,

while the zone of twilight swept across the continent. As the last rays of sunlight faded from the clouds, the miles of mercury arcs along the great highways sprang into life. By the million, fluorescent tubes began to glow in the cities; housewives switched on their radio-cookers to prepare the evening meal. The needles of the megawattmeters began to creep up the scales.

These were the normal loads. But on a mountain three hundred miles to the south a giant cosmic ray analyser was being rushed into action to await the expected shower from the new supernova in Capricornus, which the astronomers had detected only an hour before. Soon the coils of its five-thousand-ton magnets began to drain their enormous currents from the thyatron converters.

A thousand miles to the west, fog was creeping towards the greatest airport in the hemisphere. No one worried much about fog, now, when every plane could land on its own radar in zero visibility, but it was nicer not to have it around. So the giant dispersers were thrown into operation, and nearly a thousand megawatts began to radiate into the night, coagulating the water droplets and clearing great swaths through the banks of mist.

The meters in the power station gave another jump, and the engineer on duty ordered the stand-by generators into action. He wished the big, new machine was finished; then there would be no more anxious hours like these. But he thought he could handle the load. Half an hour later the Meteorological Bureau put out a general frost warning over the radio. Within sixty seconds, more than a million electric fires were switched on in anticipation. The meters passed the danger mark and went on soaring.

With a tremendous crash three giant circuit breakers leaped from their contacts. Their arcs died under the fierce blast of the helium jets. Three circuits had opened—but the fourth breaker had failed to clear. Slowly, the great copper bars began to glow cherry-red. The acrid smell of burning insulation filled the air and molten metal dripped heavily to the floor below, solidifying at once on the concrete slabs.

TECHNICAL ERROR

Suddenly the conductors sagged as the load ends broke away from their supports. Brilliant green arcs of burning copper flamed and died as the circuit was broken. The free ends of the enormous conductors fell perhaps ten feet before crashing into the equipment below. In a fraction of a second they had welded themselves across the lines that led to the new generator.

Forces greater than any yet produced by man were at war in the windings of the machine. There was no resistance to oppose the current, but the inductance of the tremendous windings delayed the moment of peak intensity. The current rose to a maximum in an immense surge that lasted several seconds. At that instant, Nelson reached the centre of the pit.

Then the current tried to stabilise itself, oscillating wildly between narrower and narrower limits. But it never reached its steady state; somewhere, the overriding safety devices came into operation and the circuit that should never have been made was broken again. With a last dying spasm, almost as violent as the first, the current swiftly ebbed away. It was all over.

When the emergency lights came on again, Nelson's assistant walked to the lip of the rotor pit. He didn't know what had happened, but it must have been serious. Nelson, fifty feet down, must have been wondering what it was all about.

"Hello, Dick!" he shouted. "Have you finished? We'd better see what the trouble is."

There was no reply. He leaned over the edge of the great pit and peered into it. The light was very bad, and the shadow of the rotor made it difficult to see what was below. At first it seemed that the pit was empty, but that was ridiculous; he had seen Nelson enter it only a few minutes ago. He called again.

"Hello! You all right, Dick?"

Again no reply. Worried now, the assistant began to descend the ladder. He was halfway down when a curious noise, like a toy balloon bursting very far away, made him look over his shoulder. Then he saw Nelson, lying at the centre of the pit on the temporary

woodwork covering the turbine shaft. He was very still, and there seemed something altogether wrong about the angle at which he was lying.

RALPH HUGHES, chief physicist, looked up from his littered desk as the door opened. Things were slowly returning to normal after the night's disasters. Fortunately, the trouble had not affected his department much, for the generator was unharmed. He was glad he was not the chief engineer: Murdock would still be snowed under with paper work. The thought gave Dr. Hughes considerable satisfaction.

"Hello, Doc.," he greeted the visitor. "What brings you here? How's your patient getting on?"

Doctor Sanderson nodded briefly. "He'll be out of hospital in a day or so. But I want to talk to you about him."

"I don't know the fellow—I never go near the plant, except when the Board goes down on its collective knees and asks me to. After all, Murdock's paid to run the place."

Sanderson smiled wryly. There was no love lost between the chief engineer and the brilliant young physicist. Their personalities were too different, and there was the inevitable rivalry between theoretical expert and "practical" man.

"I think this is up your street, Ralph. At any rate, it's beyond me. You've heard what happened to Nelson?"

"He was inside my new generator when the power was shot into it, wasn't he?"

"That's correct. His assistant found him suffering from shock when the power was cut off again."

"What kind of shock? It couldn't have been electric; the windings are insulated, of course. In any case, I gather that he was in the centre of the pit when they found him."

"That's quite true. We don't know what happened. But he's now come round and seems none the worse—apart from one thing." The doctor hesitated a moment, as if choosing his words carefully.

"Well, go on! Don't keep me in suspense!"

"I left Nelson as soon as I saw he

would be quite safe, but about an hour later Matron called me up to say he wanted to speak to me urgently. When I got to the ward he was sitting up in bed looking at a newspaper with a very puzzled expression. I asked him what was the matter. He answered, 'Something's happened to me, Doc.' So I said, 'Of course it has, but you'll be out in a couple of days.' He shook his head; I could see there was a worried look in his eyes. He picked up the paper he had been looking at and pointed to it. 'I can't read any more,' he said.

"I diagnosed amnesia and thought: 'This is a nuisance! Wonder what else he's forgotten?' Nelson must have read my expression, for he went on to say, 'Oh, I still know the letters and words—but *they're the wrong way round!* I think something must have happened to my eyes.' He held up the paper again. 'This looks exactly as if I'm seeing it in a mirror,' he said. 'I can spell out each word separately, a letter at a time. Would you get me a looking glass? I want to try something.'

"I did. He held the paper to the glass and looked at the reflection. Then he started to read aloud, at normal speed. But that's a trick anyone can learn—compositors have to do it with type—and I wasn't impressed. On the other hand, I couldn't see why an intelligent fellow like Nelson should put over an act like that. So I decided to humour him, thinking the shock must have given his mind a bit of a twist. I felt quite certain he was suffering from some delusion, though he seemed perfectly normal.

"After a moment he put the paper away and said, 'Well, Doc., what do you make of that?' I didn't know quite what to say without hurting his feelings, so I passed the buck and said, 'I think I'll have to hand you over to Dr. Humphries, the psychologist. It's rather outside my province.' Then he made some remark about Dr. Humphries and his intelligence tests, from which I gathered he had already suffered at his hands."

"That's correct," interjected Hughes. "All the men are grilled by the Psychology Department before they join the Company. All the same, it's

surprising what gets through," he added thoughtfully.

DR. SANDERSON smiled, and continued his story.

"I was getting up to leave when Nelson said, 'Oh, I almost forgot. I think I must have fallen on my right arm. The wrist feels badly sprained.' 'Let's look at it,' I said, bending to pick it up. 'No, the other arm,' Nelson said, and held up his *left* wrist. Still humouring him, I answered, 'Have it your own way. But you said your right one, didn't you?'

"Nelson looked puzzled. 'So what?' he replied. 'This is my right arm. My eyes may be queer, but there's no argument about that. There's my wedding ring to prove it. I've not been able to get the darned thing off for five years.'

"That shook me rather badly. Because you see, it was his left arm he was holding up, and his left hand that had the ring on it. I could see that what he said was quite true. The ring would have to be cut to get it off again. So I said: 'Have you any distinctive scars?' He answered, 'Not that I can remember.'

"'Any dental fillings?'"

"'Yes—quite a few.'"

"We sat looking at each other in silence while a nurse went to fetch Nelson's records. 'Gazed at each other with a wild surmise' is just about how a novelist might put it. Before the nurse returned, I was seized with a bright idea. It was a fantastic notion, but the whole affair was becoming more and more outrageous. I asked Nelson if I could see the things he had been carrying in his pockets. Here they are."

Dr. Sanderson produced a handful of coins and a small, leather-bound diary. Hughes recognised the latter at once as an Electrical Engineer's Diary: he had one in his own pocket. He took it from the doctor's hand and flicked it open at random, with that slightly guilty feeling one always has when a stranger's—still more, a friend's—diary falls into one's hands.

And then, for Ralph Hughes, it seemed that the foundations of his world were giving way. Until now he had listened

to Dr. Sanderson with some detachment, wondering what all the fuss was about. But now the incontrovertible evidence lay in his own hands, demanding his attention and defying his logic.

For he could read not one word of Nelson's diary. Both the print and the handwriting were *inverted*, as if seen in a mirror.

Dr. Hughes got up from his chair and walked rapidly round the room several times. His visitor sat silently watching him. On the fourth circuit he stopped at the window and looked out across the lake, overshadowed by the immense white wall of the dam. It seemed to reassure him, and he turned to Dr. Sanderson again.

"You expect me to believe that Nelson has been laterally inverted in some way, so that his right and left sides have been interchanged?"

"I don't expect you to believe anything. I'm merely giving you the evidence. If you can draw any other conclusion I'd be delighted to hear it. I might add that I've checked Nelson's teeth. All the stoppings have been transposed. Explain *that* away if you can. Those coins are rather interesting, too."

Hughes picked them up. They included a shilling, one of the beautiful new, beryl-copper crowns, and a few pence and halfpence. He would have accepted them as change without hesitation. Being no more observant than the next man, he had never noticed which way the Queen's head looked. But the lettering—Hughes could picture the consternation at the Mint if these curious coins ever came to its notice. Like the diary, they too had been laterally inverted.

Dr. Sanderson's voice broke into his reverie.

"I've told Nelson not to say anything about this. I'm going to write a full report; it should cause a sensation when it's published. But we want to know *how* this has happened. As you are the designer of the new machine, I've come to you for advice."

Dr. Hughes did not seem to hear him. He was sitting at his desk with his hands outspread, little fingers touching. For the first time in his life he was thinking

seriously about the difference between left and right.

DR. SANDERSON did not release Nelson from hospital for several days, during which he was studying his peculiar patient and collecting material for his report. As far as he could tell, Nelson was perfectly normal apart from his inversion. He was learning to read again, and his progress was swift after the initial strangeness had worn off. He would probably never again use tools in the same way that he had done before the accident; for the rest of his life, the world would think him left-handed. However, that would not handicap him in any way.

Dr. Sanderson had ceased to speculate about the cause of Nelson's condition. He knew very little about electricity: that was Hughes' job. He was quite confident that the physicist would produce the answer in due course; he had always done so before. The Company was not a philanthropic institution, and it had good reason for retaining Hughes' services. The new generator, which would be running within a week, was his brain child, though he had had little to do with the actual engineering details.

Dr. Hughes himself was less confident. The magnitude of the problem was terrifying; for he realised, as Sanderson did not, that it involved utterly new regions of science. He knew that there was only one way in which an object could become its own mirror image. But how could so fantastic a theory be proved?

He had collected all available information on the fault that had energised the great armature. Calculations had given an estimate of the currents that had flowed through the coils for the few seconds they had been conducting. But the figures were largely guesswork; he wished he could repeat the experiment to obtain accurate data. It would be amusing to see Murdock's face if he said: "Mind if I throw a perfect short across generators One to Ten sometime this evening?" No, that was definitely out.

It was lucky he still had the working model. Tests on it had given some ideas

of the fields produced at the generator's centre, but their magnitudes were a matter of conjecture. They must have been enormous. It was a miracle that the windings had stayed in their slots.

For nearly a month Hughes struggled with his calculations and wandered through regions of atomic physics he had carefully avoided since he left the university. Slowly the complete theory began to evolve in his mind; he was a long way from the final proof, but the road was clear. In another month he would have finished.

The great generator itself, which had dominated his thoughts for the past year, now seemed trivial and unimportant. He scarcely bothered to acknowledge the congratulations of his colleagues when it passed its final tests and began to feed its millions of kilowatts into the system. They must have thought him a little strange, but he had always been regarded as somewhat unpredictable. It was expected of him; the Company would have been disappointed if its tame genius possessed no eccentricities.

A fortnight later, Dr. Sanderson came to see him again. He was in a grave mood.

"Nelson's back in hospital," he announced. "I was wrong when I said he'd be O.K."

"What's the matter with him?" asked Hughes in surprise.

"He's starving to death."

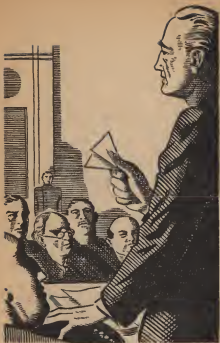
"Starving! What on earth do you mean?"

Dr. Sanderson pulled a chair up to Hughes' desk and sat down.

"I haven't bothered you for the past few weeks," he began, "because I knew you were busy on your own theories. I've been watching Nelson carefully all this time, and writing up my report. At first, as I told you, he seemed perfectly normal. I had no doubt that everything would be all right."

"Then I noticed that he was losing weight. It was some time before I was certain of it; then I began to observe other, more technical symptoms. He started to complain of weakness and lack of concentration. He had all the signs of vitamin deficiency. I gave him special vitamin concentrates, but they haven't





done any good. So I've come to have another talk with you."

Hughes looked baffled, then annoyed. "But, hang it all, you're the doctor!"

"Yes, but this theory of mine needs some support. I'm only an unknown medico—no one would listen to me until it was too late. For Nelson is dying, and I think I know why . . ."

SIR ROBERT had been stubborn at first, but Dr. Hughes had had his way, as he always did. The members of the Board of Directors were even now filing into the conference room, grumbling and generally making a fuss about the extraordinary general meeting that had just been called. Their perplexity was still further increased when they heard that Hughes was going to address them. They all knew the physicist and his reputation—but he was a scientist and they were business men. What was Sir Robert planning?

Dr. Hughes, the cause of all the trouble, felt annoyed with himself for being nervous. His opinion of the Board

of Directors was not flattering, but Sir Robert was a man he could respect, so there was no reason to be afraid of them. It was true that they might consider him mad, but his past record would take care of that. Mad or not, he was worth thousands of pounds to them.

Dr. Sanderson smiled encouragingly at him as he walked into the conference room. The smile was not very successful, but it helped. Sir Robert had just finished speaking. He picked up his glasses in that nervous way he had, and coughed deprecatingly. Not for the first time, Hughes wondered how such an apparently timid old man could rule so vast a commercial empire.

"Well, here is Dr. Hughes, gentlemen. He will—ahem—explain everything to you. I have asked him not to be too technical. You are at liberty to interrupt him if he ascends into the more rarefied stratosphere of higher mathematics. Dr. Hughes . . ."

Slowly at first, and then more quickly as he gained the confidence of his audience, the physicist began to tell his story. Nelson's diary drew a gasp of amazement from the Board, and the inverted coins proved fascinating curiosities. Hughes was glad to see that he had aroused the interest of his listeners. He took a deep breath and made the plunge he had been fearing.

"You have heard what has happened to Nelson, gentlemen, but what I am going to tell you now is even more startling. I must ask for your very close attention."

He picked up a rectangular sheet of notepaper from the conference table, folded it along a diagonal and tore it along the fold.

"Here we have two right-angled triangles with equal sides. I lay them on the table—so." He placed the paper triangles side by side on the table, with their hypotenuses touching, so that they formed a kite-shaped figure. "Now, as I have arranged them, each triangle is the mirror image of the other. You can imagine that the plane of the mirror is along the hypotenuse. This is the point I want you to notice. As long as I keep the triangles in the plane of the table, I

can slide them around as much as I like, but I can never place one so that it exactly covers the other. Like a pair of gloves, they are not interchangeable although their dimensions are identical."

He paused to let that sink in. There were no comments, so he continued.

"Now, if I pick up one of the triangles, turn it over in the air and put it down again, the two are no longer mirror images, but have become completely identical—so." He suited the action to the words. "This may seem very elementary—in fact, it is so. But it teaches us one very important lesson. The triangles on the table were flat objects, restricted to two dimensions. To turn one into its mirror image I had to lift it up and rotate it in the third dimension. Do you see what I am driving at?"

He glanced round the table. One or two of the directors nodded slowly in dawning comprehension.

"Similarly, to change a solid, three-dimensional body, such as a man, into its analogue or mirror image, it must be rotated in a *fourth* dimension. I repeat—a fourth dimension."

There was a strained silence. Someone coughed, but it was a nervous, not a sceptical cough.

"Four-dimensional geometry, as you know"—he'd be surprised if they did—"has been one of the major tools of mathematics since before the time of Einstein. But until now it has always been a mathematical fiction, having no real existence in the physical world. It now appears that the unheard-of currents, amounting to millions of amperes, which flowed momentarily in the windings of our generator must have produced a certain *extension* into four dimensions, for a fraction of a second and in a volume large enough to contain a man. I have been making some calculations and have been able to satisfy myself that a 'hyperspace' about ten feet on a side was, in fact, generated: a matter of some ten thousand quartic — not cubic! — feet. Nelson was occupying that space. The sudden collapse of the field when the circuit was broken caused the rotation of the space, and Nelson was inverted.

"I must ask you to accept this theory, as no other explanation fits the facts. I have the mathematics here if you wish to consult them."

HE WAVED the sheets in front of his audience, so that the directors could see the imposing array of equations. The technique worked—it always did. They cowered visibly. Only McPherson, the secretary, was made of sterner stuff. He had had a semi-technical education and still read a good deal of popular science, which he was fond of airing whenever he had the opportunity. But he was intelligent and willing to learn, and Dr. Hughes had often spent official time discussing some new scientific theory with him.

"You say that Nelson has been rotated in the Fourth Dimension—but I thought Einstein had shown that the Fourth Dimension was time."

Hughes groaned inwardly. He had been anticipating this red herring.

"I was referring to an additional dimension of *space*," he explained patiently. "By that I mean a dimension, or direction, at right-angles to our normal three. One can call it *the* Fourth Dimension if one wishes. With certain reservations, time may also be regarded as a dimension. As we normally regard space as three-dimensional, it is then customary to call time the Fourth Dimension. But the label is arbitrary. As I'm asking you to grant me four dimensions of space, we must call time the *Fifth* Dimension."

"Five dimensions! Good heavens!" exploded someone further down the table.

Dr. Hughes could not resist the opportunity. "Space of several *million* dimensions has been frequently postulated in sub-atomic physics," he said quietly.

There was a stunned silence. No one, not even McPherson, seemed inclined to argue.

"I now come to the second part of my account," continued Dr. Hughes. "A few weeks after his inversion we found that there was something wrong with Nelson. He was taking food normally, but it didn't seem to nourish him

properly. The explanation has been given by Dr. Sanderson, and leads us into the realms of organic chemistry. I'm sorry to be talking like a text-book, but you will soon realise how vitally important this is to the Company. And you also have the satisfaction of knowing that we are now all on equally unfamiliar territory."

That was not quite true, for Hughes still remembered some fragments of his chemistry. But it might encourage the stragglers.

"Organic compounds are composed of atoms of carbon, oxygen and hydrogen, with other elements, arranged in complicated ways in space. Chemists are fond of making models of them out of knitting needles and coloured plasticine. The results are often very pretty and look like works of advanced art.

"Now, it is possible to have two organic compounds containing identical numbers of atoms, arranged in such a way that one is the mirror image of the other. They're called stereo-isomers, and are very common among the sugars. If you could set their molecules side by side, you would see that they bore the same sort of relationship as a right and a left glove. They are, in fact, called right- or left-handed — dextro or laevo — compounds. I hope this is quite clear."

Dr. Hughes looked round anxiously. Apparently it was.

"Stereo-isomers have almost identical chemical properties," he went on, "though there are subtle differences. In the last few years, Dr. Sanderson tells me, it has been found that certain essential foods, including the new class of vitamins discovered by Professor Vandenburg, have properties depending on the arrangement of their atoms in space. In other words, gentlemen, the left-handed compound might be essential for life, but the right-handed one would be of no value. This in spite of the fact that their chemical formulae are identical.

"You will appreciate, now, why Nelson's inversion is much more serious than we at first thought. It's not merely a matter of teaching him to read again, in which case—apart from its philosophical interest—the whole business would be trivial. He is actually starving to

death in the midst of plenty, simply because he can no more assimilate certain molecules of food than we can put our right foot into a left boot.

"Dr. Sanderson has tried an experiment which has proved the truth of this theory. With very great difficulty, he has obtained the stereo-isomers of many of these vitamins. Professor Vandenburg himself synthesised them when he heard of our trouble. They have already produced a very marked improvement in Nelson's condition."

Hughes paused and drew out some papers. He thought he would give the Board time to prepare for the shock. If a man's life were not at stake, the situation would have been very amusing. The Board was going to be hit where it would hurt most.

"As you will realise, gentlemen, since Nelson was injured—if you can call it that—while he was on duty, the Company is liable to pay for any treatment he may require. We have found that treatment, and you may wonder why I have taken so much of your time telling you about it. The reason is very simple. The production of the necessary stereo-isomers is almost as difficult as the extraction of radium—more so, in some cases. Dr. Sanderson tells me that it will cost over five thousand pounds *a day* to keep Nelson alive."

The silence lasted for half a minute; then everyone started to talk at once. Sir Robert pounded on the table, and presently restored order. The council of war had begun.

THREE HOURS later, an exhausted Hughes left the conference room and went in search of Dr. Sanderson, whom he found fretting in his office.

"Well, what's the decision?" asked the doctor.

"What I was afraid of. They want me to re-invert Nelson."

"Can you do it?"

"Frankly, I don't know. All I can hope to do is to reproduce the conditions of the original fault as accurately as I can."

"Weren't there any other suggestions?"

"Quite a few, but most of them were

stupid. McPherson had the best idea. He wanted to use the generator to invert normal food so that Nelson could eat it. I had to point out that to take the big machine out of action for this purpose would cost several millions a year, and in any case the windings wouldn't stand it more than a few times. So that scheme collapsed. Then Sir Robert wanted to know if you could guarantee there were no vitamins we'd overlooked, or that might still be undiscovered. His idea was that in spite of our synthetic diets we might not be able to keep Nelson alive after all."

"What did you say to that?"

"I had to admit it was a possibility. So Sir Robert is going to have a talk with Nelson. He hopes to persuade him to risk it; his family will be taken care of if the experiment fails."

Neither of the two men said anything for a few moments. Then Dr. Sanderson broke the silence.

"Now you understand the sort of decision a surgeon often has to make," he said.

Hughes nodded in agreement. "It's a beautiful dilemma, isn't it? A perfectly healthy man—but it will cost two millions a year to keep him alive, and we can't even be sure of that. I know the Board's thinking of its precious balance sheet more than anything else, but I don't see any alternative. Nelson will have to take a chance."

"Couldn't you make some tests first?"

"Impossible. It's a major engineering operation to get the rotor out. We'll have to rush the experiment through when the load on the system is at minimum. Then we'll slam the rotor back, and tidy up the mess our artificial short has made. All this has to be done before the peak loads come on again. Poor old Murdock's mad as hell about it."

"I don't blame him. When will the experiment start?"

"Not for a few days, at least. Even if Nelson agrees, I've got to fix up all my gear."

No one was ever to know what Sir Robert said to Nelson during the hours they were together. Dr. Hughes was

more than half prepared for it when the telephone rang and the Old Man's tired voice said: "Hughes? Get your equipment ready. I've spoken to Murdock, and we've fixed the time for Tuesday night. Can you manage by then?"

"Yes, Sir Robert."

"Good. Give me a progress report every afternoon until Tuesday. That's all."

THE ENORMOUS room was dominated by the great cylinder of the rotor, hanging thirty feet above the gleaming plastic floor. A little group of men stood silently at the edge of the shadowed pit, waiting patiently. A maze of temporary wiring ran to Dr. Hughes' equipment—multibeam oscilloscopes, megawattmeters and microchronometers, and the special relays that had been constructed to make the circuit at the calculated instant.

That was the greatest problem of all. Dr. Hughes had no way of telling when the circuit should be closed; whether it should be when the voltage was at maximum, when it was at zero, or at some intermediate point on the sine wave. He had chosen the simplest and safest course. The circuit would be made at zero voltage; when it opened again would depend on the speed of the breakers.

In ten minutes the last of the great factories in the service area would be closing down for the night. The weather forecast had been favourable; there would be no abnormal loads before morning. By then, the rotor had to be back and the generator running again. Fortunately, the unique method of construction made it easy to reassemble the machine, but it would be a very close thing and there was no time to lose.

When Nelson came in, accompanied by Sir Robert and Dr. Sanderson, he was very pale. He might, thought Hughes, have been going to his execution. The thought was somewhat ill-timed, and he put it hastily aside.

There was just time enough for a last, quite unnecessary check of the equipment. He had barely finished when he heard Sir Robert's quiet voice.

"We're ready, Dr. Hughes."

Rather unsteadily, he walked to the edge of the pit. Nelson had already descended, and as he had been instructed, was standing at its exact centre, his upturned face a white blob far below. Dr. Hughes waved a brief encouragement and turned away, to rejoin the group by his equipment.

He flicked over the switch of the oscilloscope and played with the synchronising controls until a single cycle of the mains wave was stationary on the screen. Then he adjusted the phasing: two brilliant spots of light moved towards each other along the wave until they had coalesced at its geometric centre. He looked briefly towards Murdock, who was watching the megawattmeters intently. The engineer nodded. With a silent prayer, Hughes threw the switch.

There was the tiniest *click* from the relay unit. A fraction of a second later, the whole building seemed to rock as the great conductors crashed over in the switch room three hundred feet away. The lights faded, and almost died. Then it was all over. The circuit breakers, driven at almost the speed of an explosion, had cleared the line again. The lights returned to normal and the needles of the megawattmeters dropped back on to their scales.

The equipment had withstood the overload. But what of Nelson?

Dr. Hughes was surprised to see that Sir Robert, for all his sixty years, had already reached the generator. He was standing by its edge, looking down into the great pit. Slowly, the physicist went to join him. He was afraid to hurry; a growing sense of premonition was filling his mind. Already he could picture Nelson lying in a twisted heap at the centre of the well, his lifeless eyes staring up at them reproachfully. Then came a more horrible thought. Suppose the field had collapsed too soon, when the inversion was only partly completed? In another moment, he would know the worst.

There is no shock greater than that of the totally unexpected, for against it the mind has no chance to prepare its defences. Dr. Hughes was ready for almost anything when he reached the

generator. Almost, but not quite . . .

He did not expect to find it completely empty.

What came after, he could never perfectly remember. Murdock seemed to take charge then. There was a great flurry of activity, and the engineers swarmed in to replace the giant rotor. Somewhere in the distance he heard Sir Robert saying, over and over again: "We did our best—we did our best." He must have replied, somehow, but everything was very vague . . .

IN THE GREY hours before the dawn, Dr. Hughes awoke from his fitful sleep. All night he had been haunted by his dreams, by weird fantasies of multi-dimensional geometry. There were visions of strange, other-worldly universes of insane shapes and intersecting planes along which he was doomed to struggle endlessly, fleeing from some nameless terror. Nelson, he dreamed, was trapped in one of those unearthly dimensions, and he was trying to reach him. Sometimes he was Nelson himself, and he imagined that he could see all around him the universe he knew, strangely distorted and barred from him by invisible walls.

The nightmare faded as he struggled up in bed. For a few moments he sat holding his head, while his mind began to clear. He knew what was happening: this was not the first time the solution of some baffling problem had come suddenly upon him in the night.

There was one piece still missing in the jigsaw puzzle that was sorting itself out in his mind. One piece only—and suddenly he had it. There was something that Nelson's assistant had said, when he was describing the original accident. It had seemed trivial at the time; until now, Hughes had forgotten all about it.

*"When I looked inside the generator, there didn't seem to be anyone there, so I started to climb down the ladder . . ."*

What a fool he had been! Old McPherson had been right, or partly right, after all!

The field had rotated Nelson in a fourth dimension of space, but there had been a displacement in time as well. On the first occasion it had been a matter of

seconds only. This time, the conditions must have been different in spite of all his care. There were so many unknown factors, and the theory was more than half guesswork.

Nelson had not been inside the generator at the end of the experiment. *But he would be.*

Dr. Hughes felt a cold sweat break out all over his body. He pictured that thousand-ton cylinder, spinning beneath the drive of its fifty million horse-power. Suppose something suddenly materialised in the space it already occupied . . . ?

He leaped out of bed and grabbed the private phone to the power station. There was no time to lose—the rotor

would have to be removed at once. Murdock could argue later.

Very gently, something caught the house by its foundations and rocked it to and fro, as a sleepy child may shake its rattle. Flakes of plaster came planing down from the ceiling; a network of cracks appeared as if by magic in the walls. The lights flickered, became suddenly brilliant, and faded out.

Dr. Hughes threw back the curtain and looked towards the mountains. The power station was invisible beyond the foothills of Mount Perrin, but its site was clearly marked by the vast column of debris that was slowly rising against the bleak light of the dawn.

THE END.

# Going Down!

By THOMAS SHERIDAN

*The astronauts want to get to other worlds to add to our knowledge of the cosmos. But we might find out a lot more right here on Earth . . . if we could only get beneath its skin.*

WHAT IS THIS ball on which we live? It's a strange fact, but true, that we know more about the composition of the Sun and the distant stars than we do of the interior of our own planet. Geologists differ about the temperature at Earth's centre, estimates varying between 11,000 degrees Fahrenheit and as much as 440,000 degrees. Another thinks it has a core of molten glass under a pressure of 50 million pounds per square inch. Each speculation has a certain amount of evidence to support it, but since nobody's been there . . .

It is fairly generally accepted that there is a central core consisting of such heavy elements as uranium, thorium and polonium, but as to its precise nature and dimensions we cannot be certain.

Nor can we say in what form these heavy metals exist under the terrific temperatures and pressures which must, presumably, obtain at the heart of the planet. The only thing we can safely say is that human life would be hardly likely to survive under such conditions.

Surrounding this core, according to theory, is a deep layer of molten metal, or magma, some 3,000 miles thick. Above this lies a cooler, solid mass of iron and nickel about 1,000 miles in thickness. On top of this, in turn, is a ten-mile layer of basaltic lava, neither solid nor liquid, which acts as a cushion between the metal beneath and Earth's outer crust or lithosphere—the layer of good, solid rock, thirty to fifty miles thick, on which we build our cities.

Most of this, however, is pure conjecture—so much geological guesswork, which might easily be disproved if we could only get down to the facts. The Earth has been said to resemble a golf-ball with a rough skin and a spongy, elastic core. But it has also been likened to an orange—of which we have not yet punctured the skin.

THE DEEPEST hole man has bored, so far, in the outer shell of his mysterious planet is an oil well in the San Joaquin Valley of California which goes down for 15,000 feet—almost three miles. He would have to dig down at least ten times as far to penetrate the peel of the orange and reach the juicy inside. And the holes he has bored for the specific purpose of geological research have been no more than pin-pricks on the skin of Mother Earth. The deepest, in Germany, went down a mere 7,300 feet.

But as well as aspiring to greater heights above the surface of his world, man has long nursed ambitions of progress in the opposite direction. Sir Charles Parsons, who invented the steam turbine, had a plan to bore a hole ten miles deep in the Earth's crust for the purpose of tapping the internal heat as a source of power. Another British engineer, John Hodgson, wanted to penetrate three times as far, but was put off by the prohibitive cost of the undertaking—a matter of £60,000,000.

Of recent years, there have been many similar projects to "cash in" on this natural reserve of heat which manifests itself in hot springs and geysers. Although nobody would listen to Dr. Zielinsky, of Budapest, who produced a scheme for heating the entire city by means of the hot springs nearby, his plans were adopted for an experimental power plant designed to give warmth to the citizens of Reykjavik, capital of Iceland. And a German project involving two bores, each three miles deep, in which super-heated water would be distributed to power stations and heating plants, was designed to produce energy equivalent to three million kilowatts a day.

But all this was before the Age of Atomic Power. And, anyway, we can't be too certain about those supposedly vast resources of heat-energy down below. Some theorists contend that the relatively slight increases in temperature we encounter as we penetrate deeper into the Earth's crust may be due to radio-activity in the surrounding rock rather than to any internal fires, and that the heat immediately available from a deep bore would soon be dissipated. Still, it has been estimated that the Earth's store of natural heat amounts to thirty million times as much as we can obtain from the whole of its coal resources.

AND THE geologists have other motives for wanting to get below the skin of the orange. Dr. Harlow Shapley, of Harvard University, has long fostered the idea of permanent research laboratories at various depths underground, where we might obtain unlimited data, not only concerning the Earth's interior but in a dozen different fields.

Down there, paradoxically, we would find the answer to many riddles which baffle the scientist on the surface. As well as rewarding us with new sources of mineral wealth, by burrowing deep into the planet we would learn much about earthquake waves, terrestrial magnetism, gravitation, and the effects of lunar and solar influences upon the Earth's bulk. All of which might throw fresh light upon its place in the astronomical scheme of things. Indeed, while the geologists were making tests to determine whether the continents were shifting their positions, the astro-physicists would be considering the problem of the Earth's origin from this new standpoint, while the biologists would be experimenting in the effects of cosmic rays and radium emanations at subterranean levels.

If these plans materialise, the near future will see the dawning of a new era in geo-physical research, in which man will acquire new knowledge of the universe by adopting a viewpoint strangely reminiscent of the ostrich.

THE END.



# The Pain Machine

By L. V. HEALD

*Turning pain into pleasure seemed a good idea—and the machine did just that. But sometimes machines can work too well . . .*

SO YOU'RE from the *Sunday Globe*—and you want my views as a doctor on the subject of pain? You want to tell your readers if we shall ever be able to find a universal pain remover, a machine that will banish pain completely and harmlessly. Yes, I understand.

It's strange that you should come to me, unless it's on the strength of those articles I wrote a few years ago? Yes, I thought so. But they didn't tell half the story. We thought it best to keep the thing quiet, for all our sakes. But there's no harm in telling you the whole story, now.

There *was* such a machine. The Pain Machine we called it. But first, about pain itself. What is it? Or, rather, *why* is it? Why should we have to put up with it at all? Your readers, you say, want to know what a medical man has to say about that.

Well, the general opinion is that pain is necessary as a warning, a signal that the body needs attention. Unfortunately, though, we aren't always able to stop it. If we can't supply the remedy for the trouble, the pain persists. Consequently, because our knowledge is still limited, thousands are condemned to suffer, sometimes all their lives, without hope of a cure. Of course, they can get some relief from drugs; but what your readers want is something that will put a stop to the torture they have to endure, completely and harmlessly, at the turn of a switch.

I'm afraid they're going to be disappointed. It just won't work. You see . . . But let me begin at the beginning.

I was closing my surgery one evening—it must be five years ago now—when one of my panel patients, a young man named Alan Russell, came in. He was an



electrician; he'd done one or two jobs for me at times, so we knew each other pretty well, though he didn't often have need of me. He was too busy with his constant tinkering to find time to be ill; always trying to invent something.

"Well, Russell," I enquired as he entered my consulting room, "what's wrong with you?"

He smiled, and his blue eyes twinkled. "Nothing, doctor. But I've got something I think will interest you."

"All right," I said, for he was not the sort that would waste my time on inconsequential. He was clever, all right, and I knew that if he had something to show me it should be worth looking at. And there was an air of suppressed excitement about him that made me curious. From the nervous, jerky movements of his capable-looking hands and the way they trembled slightly as he pushed the hair out of his eyes, it was obvious that it was important—to him, anyway.

Under his arm he carried a small, oblong box of ebonite wrapped round with a length of thin cable ending in two loops, which he carefully unwound before placing the box on my desk. I scrutinised the thing closely, but there was nothing to give any indication of its purpose. Nor did he enlighten me.

"Fix these wire loops tightly round your wrists," he instructed me, confidently.

"What is this?" I demanded, though I did as he requested, knowing that he wasn't the one to play unpleasant jokes.

"You'll soon see, doctor," he reassured me. "Now, get out your lancet."

The cable was split at the end to allow of free movement. Again I obeyed. He drew in his breath at the bright sharpness of the instrument, then ordered: "Now, cut your finger."

"What!" I protested. "Why should I?"

"Go on," he urged. "Just a nick."

For a moment I had doubts of his sanity, but the look of deadly earnest in his face allayed my suspicions. In any case, I thought it best to humour him, so I made a small cut on the little finger of my left hand. The result was amazing.

Only by an effort did I prevent myself from running the knife deeper into my flesh. For I felt no pain. Instead, the sensation was rather pleasant.

Yes, it was actually enjoyable! But I kept silent. Russell was watching me like a hawk, obviously impatient for my reactions. But I wanted to be certain I wasn't deluding myself, so I tried again, this time inserting the point of the knife into the quick beneath my left thumbnail. Still there was no pain; only the strange, pleasant feeling I had experienced before.

"Well, doctor?"

"It appears to stop pain—to change it in some way," I suggested.

"It does!" he announced, triumphantly. "Don't you see? It transforms pain into pleasure." His eyes sparkled.

UNFASTENING the wires from my wrists, I got to my feet to pace the floor, to consider the significance of this thing. Like all doctors, I was deeply concerned with the alleviation of pain. This was a remarkable invention, which would come as a boon to millions. I began to have visions of a marvellous future when the world would be free of the curse of pain. But first I wanted to know more about how it worked.

"Tell me, Russell," I requested. "What's the principle behind this thing?"

"I don't know," he confessed, bluntly. "I stumbled on it by accident. I was trying to work out an idea for a machine which would tone up the nervous system electrically, to keep people virile and energetic. I must have gone wrong somewhere, for when I tried it nothing seemed to happen apart from a slight tingling sensation which I hadn't accounted for. Then I found that one of the bare wires I was using had scratched my wrist rather badly, but I hadn't felt it at all. That put me on the track of this. When I was sure it worked, I made this finished model."

"I see. But what tests have you carried out?"

"Oh, I've tried it on myself—and on the dog. Rex likes having his tail nipped." He grinned boyishly in reflection.

But I was in no such mood. I couldn't quite credit his lack of knowledge concerning his own apparatus. "And you really haven't any idea how it works?" I insisted.

"Not really." His blue eyes clouded. "Of course, I have a theory, but I wouldn't like to say if it's right or not. The idea behind the Invigorator was to stimulate the nervous system by passing a special form of high-frequency current through the body. I can only assume that instead the current somehow short-circuits the nerves controlling the pain and pleasure impulses, so that when it reaches the brain pain registers as pleasure."

The theory sounded plausible. I picked up the black box and examined it critically. "Where's the switch?" I asked.

"This is only an experimental model," he explained. "There's no need for a switch. Simply closing the circuit starts the current, which is supplied from a special battery. It will run for several days without renewal."

For a minute or two I considered further. If Russell had wrought the miracle I was beginning to believe in, this machine would bring the greatest advance in medicine since Morton's introduction of anaesthesia a hundred years before. Undying fame would be his—and mine too, if I assisted him. But it was too early to think of that. The apparatus would have to be subjected to severe tests before it could be accepted by the medical profession and introduced to the world. I told the inventor as much, assuring him that I would help in every way I could if he needed my assistance.

"Of course," he agreed. "That's why I wanted you to see it. You can carry out any tests you like."

I was almost as enthusiastic as Russell, now. We went over to Brown's, the dentist who practised just opposite my surgery. We had been good friends for years. He was awaiting his last patient of the day, and could spare us a few minutes, though I felt it was more out of friendliness than interest that he listened to our claims for the little black box.

"But d'you mean to tell me this thing

will make people *enjoy* having their teeth out?" He was both amused and incredulous.

"You could put it like that," I told him.

"And you want me to buy one, I suppose?" He regarded Russell with deep suspicion.

"No," I said. "Nothing like that. We just want you to try it out."

"You mean you want me to fix it on to one of my patients and then make an extraction—without an anaesthetic?"

"That's it. By way of an experiment. Though we're pretty certain it will work. We just want to make as many different tests as we can."

The dentist stared hard at us, then slowly shook his head. "I'm sorry," he apologised. "I'd like to help you, but I can't expect my patients to let me make guinea-pigs of them."

His attitude was understandable, since he had yet to be convinced himself. I turned to Russell. "Give him the demonstration you gave me. Perhaps he'll see things differently."

Again out of deference to me, he allowed us to fix the looped wires around his wrists. Then I produced my lancet and, waving his objections aside, made a small incision. A moment later he was staring dazedly at a bleeding finger-nail.

"It's marvellous. I can't believe it. It makes pain almost a pleasure!"

"And you'll try it on a patient?"

This time the bald head moved up and down instead of from side to side.

"You're lucky. Mrs. Parker's coming to see me. She's one of your patients, Waterson. She's terrified of injections, but she's got to have an extraction. If I ask her permission to use your machine I think she'll agree all right."

She did. Though a little dubious at first, when told that it would mean she need not have "the needle," she trustfully allowed us to apply the wires to her wrists. Then we stood back while Brown busied himself with the patient.

For my part, I felt somewhat anxious, wondering if Russell's machine would stand the test. I saw Brown's muscles flex; there was a long, gasping sigh from Mrs. Parker, and the dentist brandished the tooth he had drawn.

In a moment, the lady looked up from the rinsing bowl at her side. She was smiling broadly.

"That was lovely!" she enthused. "It tickled!"

I WAS EVEN more impressed by that demonstration of the Pain Machine's powers than I had been when I tried it on myself. But I was far from satisfied as yet. I forced myself to keep calm, determined not to dwell on the alluring possibilities that lay ahead until there was absolutely no room for doubt. Next we would test the machine on my patient, Bentley. If it worked, it would clinch the matter as far as I was concerned.

I drove Russell to the house. He said little, but his face was enough to show his mounting confidence in his invention, and his slim hands still trembled with eager anticipation as he cuddled the box in his lap.

Bentley, poor devil, was a very sick man. There was nothing much I could do for him. An internal tumour was making his last days a hell on earth. The drawn, haggard face and shrunken body testified to the torture he suffered. My young friend could not help but wince when he saw the pitiful relic of what had once been a man.

The elderly housekeeper admitted us, accepting Russell's presence as easily as she had accustomed herself to my frequent visits. But my patient showed no sign of having noticed our entry. He lay on his bed staring vacantly at the ceiling; nor did he move as I attached the wire loops to the thin, white wrists, then stood by to await results.

A worried look crept into Russell's blue eyes as the minutes slipped past, bringing no reaction in the patient, whose pallid features continued to twitch spasmodically at the pain he habitually endured. Simultaneously, a horrible feeling of disappointment flooded through me. Here, evidently, was failure.

Then, just as I was on the point of removing the wires, the man on the bed suddenly stirred. He turned his head to look up at us with eyes that were strangely calm and clear, without any hint of pain.

Then he smiled, slowly and hesitantly at first; but the blue lips steadily lengthened as the eyes brightened, until the wasted features wore an expression of sheer delight such as I had never seen.

"Hello, doctor," he greeted me in a voice that was steadier and stronger than it had been for many a day, though it was still little more than a whisper.

"How do you feel?" I asked, trying to sound as much like my professional self as possible.

"Fine!" The growing realisation showed in his beaming face. "All the pain's gone. There's the funniest feeling—as though I wanted to laugh. Something wonderful has happened to me."

My hopes soared again. The transformation of Bentley from a hopeless creature wracked with agony to a smiling, happy man, was surely enough to convince the utmost sceptic of the marvel Russell had accomplished. My eyes met his. He, too, was smiling again. I breathed a sigh of genuine relief, and turned back to my patient.

There was the faintest suggestion of colour in the sunken cheeks. "It's wonderful, doctor. Does it mean I'm getting better?" He hardly dared to entertain the hope.

"I can't say yet," I told him. "But I fancy you'll have an easier time from now on." Then, to my companion, I whispered: "How soon can you make a machine for him?"

"By morning."

"Good. Then you must let me have it first thing, and I'll bring it over for him."

I bent over the bed and took the wires from the invalid's wrists. The result was startling. He gave a sudden, hoarse cry followed by a hollow groan, and his thin face contorted as agony returned to him.

"Please, doctor!" he pleaded.

Russell looked horror-stricken. He was a sensitive sort of fellow. "Put them back!" he shouted in alarm.

I needed no urging. Hurriedly I replaced the wires. Immediately Bentley relaxed, his face resumed its former calm, and he smiled weakly up at me.

"Sorry, doctor," he whispered. "The pain came back for a minute, but I'm all right now."

I beckoned Russell away from the bed. "We'd better leave it on him. It gives him such relief, it would be cruel to take it away from him."

He agreed unhesitatingly. "I've another model nearly ready. But we'd better make sure the wires don't slip off in his sleep." He produced a couple of wristlet bands which he fastened about Bentley's wrists over the wire loops. "Now he should be all right."

I PAUSED a moment, considering. I realised I was taking a risk, leaving my patient under the influence of an apparatus which was still in the testing stage and whose working principles were doubtful even to the inventor. But, seeing the absolute relief it brought to poor Bentley, I decided the risk was worth it, if there was any risk at all. If anything went wrong, I could be over in a couple of minutes. So, leaving word with Miss Wicks to keep a careful eye on the patient and to call me instantly if there was the slightest change in his condition, we left the house.

"Well, Russell," I said as we climbed into the car, "what do you propose to do with your invention?"

"So you're convinced, now?" He put the question a little doubtfully, I thought. The effect of taking the wires off Bentley had unnerved him, rather; nor had it left me entirely happy. Despite the evidence of the machine's capacity to give surcease to pain such as he normally suffered, there were little, gnawing apprehensions in my mind which I could not resolve. I was trying not to admit them even to myself, but they were none the less insistent, undermining my former confidence.

"I am very much impressed," I admitted, non-committally, not wishing to buoy up his hopes too far, in case the tests we still had to make were less successful. "But we mustn't reach any hasty conclusions. We have still much to learn about it, and we have to impress others as well as ourselves."

"Yes, I suppose so," he conceded. Then, seeing his crestfallen look, I added hastily: "But there's every reason to be optimistic about it. And, of course, I'll help you all I can." I was trying to

banish my own half-formed fears as well as his.

By the time I had dropped him at his home we had decided that he should let Brown have another machine that night, so that the dentist could carry out further tests on his patients next day, as we had finally persuaded him to do. I also arranged that Russell should make at least two more models, one of which I could use on other patients of mine, and also to introduce the machine to my doctor friends. My idea was to amass as much evidence as we could, until we had no doubt of its efficiency as a remover of pain however it was caused. Then we would present it to the world for the benefit of humanity, as Russell was anxious to do.

Certainly, if our expectations were fulfilled—and I preferred to dismiss my own doubts for the moment, in face of the existing evidence—Russell's name would be inscribed on the pages of history as one of man's greatest benefactors, and I fondly imagined that my own would be bracketed with his. I could picture his apparatus in every hospital and surgery, and carried by every doctor; in fact, in constant use in the universal fight against pain and suffering. The fear of pain would be driven from the world. People would laugh at having their teeth out, at undergoing operations they once dreaded; while those like Bentley, who were formerly condemned to endless agonies relieved only by injections of morphia, would spend their last days with pain actually amusing instead of tormenting them.

My mind was so full of the fascinating possibilities that I hardly slept that night. And next morning, when an urgent call came during breakfast, I cursed, for it meant I could not see Russell first thing as planned. However, I had still to perform my duties as a general practitioner whatever marvels I was engaged in producing for mankind.

When I had attended the case I went straight on my rounds, but it was close on eleven when at length I returned to my surgery. My wife met me at the door.

"Did you call on Bentley?" she wanted to know, and my heart started to thump. I *had* intended to drop in on my

way back, just to make sure that everything was all right, but being so behind already I had decided to leave it until later in the day. Though I had little doubt that Bentley was comfortable; otherwise I should have heard long before.

"I didn't," I said. "Is anything wrong?"

"Miss Wicks phoned just ten minutes ago. I tried to get hold of you, but couldn't. Bentley's bad. She said something was killing him."

I dashed back to my car and drove as fast as I could. The usually placid housekeeper was pale and agitated, as though she had suffered a terrible shock. Full of trepidation, I followed her into the sickroom. As I passed through the hall I heard poor Bentley's low groans. He was a horrible sight. His face was a ghastly white and his eyes bulged from their sockets as he tossed about on the bed, his thin fingers clawing agonisingly at the counterpane. The ebonite box was on the floor well away from the bed, its wires in tangled disarray, as though it had been thrown there.

"You took them off?" I demanded of Miss Wicks as she stood there staring helplessly.

"I had to, doctor." She cringed in fear of a reprimand. "It was killing him, and he couldn't get them off himself."

"Killing him? What do you mean?" I couldn't understand it. "You mean he wanted them off?"

"Yes, doctor. He was asleep. Then suddenly he woke up, moaning and groaning. It got worse and worse, until he was screaming with the pain and shouting at me to take the thing away. It was awful!" Her eyes still held the horror of it.

MYSTIFIED, I went to work on the patient, and at last left him sleeping with a morphia injection. Then, by careful questioning, I contrived to get from Miss Wicks a more sensible account of the sudden change in his condition. It appears that, soon after I left him the night before, he had dropped off into a sound, easy sleep, leaving her undisturbed for the first time for months. He had



wakened early in the morning, apparently in very bad-humour. Something seemed to be troubling him, and as time went on he became progressively more irritable as if the pain were gradually coming back.

At length he had started to moan, and soon he was in paroxysms, screaming and trying to take the wires off his wrists, though he had seemed scarcely aware of them before. Miss Wicks had instantly telephoned, and only when the situation had become so terrifying that she was forced to disobey my instructions had she taken the wires off Bentley.

Her story crystallised all the fears I had been striving to dissipate concerning the Pain Machine. Obviously, it alone was responsible for Bentley's further suffering. But how? Why had it ceased to have the beneficial effect we had observed the previous evening? Or had it broken down? Perhaps the battery had run out? In a new surge of hope, I tested the machine on myself. It worked perfectly. I felt only intense pleasure when I pricked my finger. There was some other explanation,

In mournful mood, now that the daydreams I had allowed myself to luxuriate in seemed farther than ever from realisation, I drove to Russell's workshop. I had the impression as he let me in that he was not very pleased to see me, and as he saw the expression on my face his frown deepened.

"Something wrong?" he asked, his blue eyes watching me closely.

"I'm afraid so," I responded dismally, and told him the whole story. He shared my concern as he listened. He looked worried, and there was a tiredness about him that was contrary to his usual eager nature. "There must be a weakness somewhere," I concluded. "Perhaps you can find it." I tried to cheer him, though I was without much hope myself.

He smiled wanly. "There's nothing wrong with the machine," he said bitterly. "It works all right, but not in the way we hoped it would. It changes pain to pleasure, but . . ."

"Yes?" I encouraged. But he had more bad news to impart.

"Brown's found the weakness, too," he went on heavily. "He brought the machine back just before you came—he almost threw it at me. He was pretty upset about it."

No wonder he looked dejected. I had been wondering if perhaps the dentist had fared better with his tests. Now my last remaining shred of hope dissolved. Russell explained in a dull monotone.

"It worked all right on his first patient this morning. The extraction didn't take more than a minute or two, as in the case of Mrs. Parker. But his next job took some time, and before long the poor devil started to howl the place down. Brown had a job with him—he wanted to sue him. After that, he decided to stick to anaesthetics."

He sighed. "The trouble is, it only seems to work up to a point. It gets rid of a pain in short order, but only for a time. Somehow, the effect wears off, so that it's no more use than a shot of cocaine. In fact, if the pain is persistent, it seems to make it worse after giving a bit of relief. Exactly why I don't know, but it's pretty obvious it's a failure. I'm sorry I disappointed you, doctor."

I said nothing. There seemed nothing to say. Suddenly I felt very old and tired. All I could do was get up and go silently, leaving Russell to his misery.

SO, YOU SEE, as I told you, it just won't work. Or, rather, it worked too well. We found that out afterwards. For the explanation was simple enough when we came to reason it out later, having got over our first bitter pangs of disappointment.

The reason why the machine didn't have any prolonged effect was that it actually changed pain into the opposite sensation of pleasure. And just as there's a limit to the pain a person can stand, so there is a limit to the intensity of pleasure that can be felt. If a pleasant sensation is maintained for too long it becomes anything but pleasant. The action which in moderation gives satisfaction yields progressively less enjoyment as its performance continues, until the opposite reaction sets in. In fact, the pleasure turns into pain, which eventually becomes so severe as to be agonising.

The old Chinese tickling torture is a good illustration of the principle. The victim can be driven mad by what, in strict moderation, causes him exquisite pleasure. So it was with Russell's machine, which transformed pain into something just as unbearable. Poor Bentley became almost insane from the increasing sensation of pleasure which at length was infinitely more intolerable than the original pain. At first the change brought relief, then genuine happiness, but as the sensation produced by the machine persisted, hour after hour, it became indescribable torment.

In the case of Brown's patients, it was much the same. As long as they were under the influence of the machine for no more than a few minutes, they felt only pleasure, but in time the feeling was intensified beyond endurance.

Another thing I found out, when we came to talking it over in my consulting room, was that Brown's report of failure and my own experience with Bentley didn't come entirely as a surprise to Russell. During the night his excitement brought on an attack of neuralgia, and the pain became so bad that he got up

and finished another machine he was making, to use on himself. It gave him relief, but he fell asleep with the thing still on him, and woke late the following morning suffering the same way that Bentley did. By that time Brown had discovered its weakness too, and his account only confirmed the inventor's own conclusions.

But it wasn't the end of his machine,

altogether. As a matter of fact, it turned out quite a success—as the Invigorator he had been designing in the first place. He experimented further, discovered where he had gone wrong and corrected his mistake, and it worked perfectly. He's one of my richest patients now.

But the Pain Machine died when the Invigorator was born. I say, let it rest in peace. I think you'll agree.

THE END.

---

## The Martians are Here—Perhaps!

*WHEN A strange, shell-like vessel came out of the skies and landed at a popular seaside resort, said resort inevitably became even more popular. It happened on a Friday, and by Monday the place was packed with special correspondents, newsreel men, rocket-ship experts, and practically everybody who had ever wondered what a Martian looked like.*

*THE GAPING crowds around the ship didn't get too close—just in case. But, contrary to all accepted rules, no pop-eyed, tentacled monsters emerged to pursue them or mow them down with annihilating rays. In fact, nothing emerged, even after three days. More, there seemed to be no place where anything could emerge from that great, shining cylinder. Yet there must be something inside . . .*

*WEEKS AFTER the disappointed crowds had melted away, the Mystery Ship from Space, no longer front page news, still lay there silent and enigmatic. It was then that Philip Bradley and Ronald Hume, young scientists with ideas, got on the job of trying to solve this cosmic conundrum. Their big problem—how to get the thing open without destroying whatever was inside, or letting it destroy them? Quite apart from the question of where not on Earth it came from.*

*THEY FOUND the answers. But only after encountering several other perplexities—including the solitary, very mystifying occupant of the space-vessel. You'll be thoroughly engrossed in their problems, too, when you read "RELIC" which Eric Frank Russell has written for the second issue of FANTASY. That's if you've been sagacious enough to ask your newsagent to reserve a copy for you.*

# FANTASY

## The Magazine of Science Fiction

# THIS ATOMIC AGE . . . .

A BATTERY of electronic calculators, evolved during the war to predict the trajectories of shells and rockets, will be installed at the National Physical Laboratory to "do sums" for the Government and industry. Another super-calculator, a mass of magnetic relays, can handle wheat prices with the same accurate ease that it dealt with precision bombing computations. And Unesco plans a world centre of applied mathematics, equipped with machines which can deliver in seconds the answers to calculations that would occupy human experts for months. We may yet submit to a Universal Robot Brain, for instant solution, the problems our world statesmen find it impossible to cope with . . . .

WHILE DESIGNS for spaceships to be driven by atomic power vie with those which rely on harnessing the cosmic rays, an Italian scientist is investigating another possible motive force—the pressure of the Sun's light. The fact that solar radiation exerts a distinct "push" is evident from the formation of comet's tails, whose minute particles are repelled by the action of light-photons. The idea is that this radiation pressure, insignificant though it seems, might be employed to propel space-vessels to the Moon and planets as though they were cosmic dust borne on an airless breeze . . .

THE CARS of tomorrow will rival each other in sheer dazzling splendour. To give them more glitter, translucent finishing lacquers have been developed which will allow light-waves to penetrate before they are reflected back—with all the more effect on the gaping pedestrian. A plastic which glows in the dark may also be used for making car bodies, so that our traffic streams will look like processions of glow-worms to the owner-pilots riding the airplanes above . . . .

FOR THEIR benefit, in case of emergency, an airplane anchor has been invented. It consists of a spike, fired from a tube by rocket power, to which a nylon rope is attached. If a careless air-driver has to land in a field in a hurry, he'll just shoot out his anchor, which will bring him down safely and quickly without a lot of manoeuvring.

PUNCTURE TROUBLE will beset the modern motorist no longer, thanks to the perfection of a rubber rivet for sealing nail-holes and small tears in tyres. He may even thumb his nose at a new quarter-inch nail so tough that it can be used to tack metal labels on cold steel bars . . . .

THOUGH THE introduction of radio newspapers in Britain is unlikely, American newspapers are running radio-imprinted facsimile editions broadcast into subscribers' homes. One receiver the size of a television set delivers four printed pages, illustrations and all, at the rate of twenty-eight square inches a minute . . . .

MODERN AGE technicians are borrowing ideas from the nursery. The old children's toy, the stereoscope, which makes pictures "come to life" in three dimensions, has been adapted by the textile industry for examining and classifying materials without any actual samples being handled. Polarised light is used in the process of making and viewing the pictures . . . .

AND THE factory designer now does his job in much the same way that young Tommy builds his model farmyard. Scale drawings of works equipment are made into magnetised picture-blocks which he lays out on floor plan models backed by metal plates, from which the completed plan is photographed . . . .

THE WORLD'S power plants will be a delight to work in, if the idea of reducing accidents by using contrasting colours to pick out danger spots catches on. Electric sub-stations in the U.S.A. have had walls, ceilings and equipment painted in many different shades, to a scientific plan with this object . . . .





# A Matter of Size

By

**NORMAN LAZENBY**

*Bigness isn't everything . . .  
And a man deprived of his sense  
of proportion is apt to overlook  
the compensations of smallness—  
even when he wants to hide.*

IN THE YEAR 2010 the wild moors of Northumberland still retained their barren, sweeping lines and hilly, bluish-tinged horizons, and their occasional woods studding hollows and fell-sides. But coal had had its day as a source of power, and the villages had dwindled to mere hamlets as the miners had migrated to the teeming cities with their fantastic, man-made attractions.

As for Crawfell Wood, even the lonely shepherds ignored it. Huge jet-liners hissed majestically over it on their scheduled routes, while nearby the stainless steel motorway bore its trains of three-decker coaches and streamlined transports, and five miles away in another direction the great Universal Grid stalked across country on its pylon legs. Crawfell Wood was lonely. Only birds and moles should have found a welcome there.

Yet Ralph Craster, thrusting warily through the wood, was looking for Adrian Calvin's home. He knew the place, a huge old building which had been a derelict mansion before Calvin had taken it over. Until two years ago, Craster had often been a guest there. But on that last occasion it had needed only

a fortnight for them to become bitterly critical of each other and part in animosity. Calvin, of course, had been at fault with his stubborn refusal to accept Craster's theories. Calvin, with his prim face and thin, pursed mouth, had an irritating way of dismissing cursorily anyone else's ideas on the subject of genetics.

Craster stepped heavily forward, yard by yard, crunching twigs and bracken under his big boots. Even amid the tall trees he seemed an unusually big man, and he moved with an ominous hunch to his wide, overcoated shoulders. There were no tracks in the wood, but he progressed with the aid of a small compass, confident that sooner or later he would come upon Calvin's house. And Adrian Calvin was the only man in the country who could help him now.

Craster's nerves were armour-plated. Shocks merely sharpened his perceptions. So he simply froze, and his hand went to his pocket, when an animal scurried away suddenly in a nearby thicket. Craster peered through the green light filtering down through the tracery above. He could have sworn he'd seen an elephant—if it had been big enough for an elephant. But whatever it was, it had not been any larger than an average-sized dog. He laughed curtly. Probably it was some kind of wild pig.

But, as he moved forward again, it stuck in his mind that this explanation was insufficient. Quite simply, he knew that the animal he had seen was not a pig. Then, within a few minutes, Calvin's house came magically into view. It stood in a large clearing, a shabby monument to its past glories. A decaying wall meandered round the place and disappeared among the trees.

Knee-deep in undergrowth, Craster stared, wondering if Calvin still lived alone except for the ancient Johnson and his equally aged wife. The old people suited him because they were uncomplaining. Frequently they were merely guardians of his dreary home while he went off seeking new information or apparatus necessary to the pursuit of his hobby. At other times they cleaned up the place and got Calvin's food; though the cleaning was perfunctory,

Craster knew, having seen the musty laboratory and its gruesome exhibits.

He came up to the house and peered through a window. Inside was Calvin's dark and depressing library. Craster moved further along. At another window he saw a bright light shining inside. Calvin was there, using the electric lamp to augment the meagre daylight filtering through the curtained windows.

Craster moved round to a side door and knocked. A minute later, Calvin opened the door to him.

"So it's Ralph Craster," he said calmly.

Craster chuckled. "You're not surprised, even though I'm quite unexpected. That's just like you, Adrian. May I come in?"

SO, AFTER two years of unfriendly silence, Ralph Craster found himself talking again with Adrian Calvin as if the hiatus had never occurred. Calvin's study was unchanged, and Craster did not doubt that somewhere in the dilapidated house old Johnson and his wife were still pottering around.

They talked of the science they both knew best—genetics; of Pierson's researches, of strange and malignant test-tube growths, of the chemical value of the human brain and of glandular experiments. As he talked, Craster took care to edge his tongue with an unusual politeness. Calvin was prim and calm. It was that superior poise which always used to irritate Craster, but now he ignored it. Then he came to the point boldly.

"I think you can help me, Adrian."

Calvin's thin lips hardly moved. "How odd! You never needed help before. Still, how can I help you?"

"In a week the Law Officers will be looking for me," said Craster with a twisted smile. "I know it will be a week, for the patient I operated on will be in a coma for that period. Then I'll be wanted—because when the man revives he'll be a vacuous idiot. The authorities will know I performed a memory operation on him. He was wealthy, eccentric, had money hidden—but what

does that matter? I need your help, Adrian."

"Did you—er—obtain the patient's money?" asked Calvin softly.

"I'll pay you for services rendered," replied Craster evenly.

"I'm always in need of more money," sighed Calvin.

Craster nodded briefly.

"The Law Officers will trace me here, undoubtedly—too many checking-points for my liking. But if you do what I want, I'll be well away before they arrive."

"And you will pay me? Very well. What can I do for you, Ralph?"

"I want a new identity," said Craster grimly. "It's not just a question of fingerprints—if that was all I had to get rid of, it would be easy. But I was coded on entering the hospital, and they've got my voice vibrations recorded."

Calvin gave a thin smile, looked over Craster's bulk, and said softly: "I can provide you with a new body."

"Good! That's just what I hoped for." Craster was eager. "Of course, I'd like to see a sample first. Then you get half the money, and the other half when I leave—as a new man. Will that suit you?"

Calvin nodded. He went to the curtained windows, opened one, and made a peculiar hissing sound. Then he stood aside from the window. Within seconds there was a loud buzzing and something the size of a blackbird flew blunderingly into the room. Craster recoiled with a snarl of anger, and put up his arm.

"It's only a house-fly," said Calvin, smoothly. "Thirty hours in my synthetic sun radiations caused the change. Surprising—you agree?"

He might have added that the clumsy giant insect would die within the next few days as a result of unsynchronised internal organs, but he did not. Instead—

"They respond to my signal in amusing fashion," he remarked pleasantly. "There is some freakishness present which I haven't bothered to analyse."

"What's all this to do with me?" asked Craster bluntly.

"Well, the best way to give you a new

physical identity is to reduce your stature. You're a big man, Ralph."

Craster said reluctantly: "Make me smaller—? Well, I don't know." He had all the big man's pride in his stature.

"If you were only one foot smaller and there were corresponding alterations in your voice vibrations, you'd beat all the Law Officers' medicals," Calvin said persuasively. "I can do that for you, Ralph."

"Reduce me!" Craster was still doubtful.

"Yes—a little."

Craster's jaw protruded in sudden decision. "Right! I can afford to shrink a foot," he laughed.

Calvin laughed, too, very gently. But he cut the laugh short, as if the ultimate issue were more important than its inherent humour.

"You've earned your money," said Craster. "Don't ask me for more now, though, because I can't do it. Here's two hundred Credits. Another two hundred when I leave."

He took the four-inch-square notes from a case, and Calvin saw that there were many more in its fine spring-files. But he did not demur at the offer. A moment later he excused himself in order to make some preparations, and left Craster in the study. Craster moved quickly, then. He found the door in the rear of the old house, and slipped out.

He was looking for a hiding place for his note-case. And he was not aware that Calvin was following him as he moved swiftly and stealthily through the wood.

THAT NIGHT, because Craster insisted that time was important, the first steps in the operation were taken. Calvin had assured him that the whole process would not take more than forty-eight hours, and that the chemical action was continuous. Craster stood in the centre of the laboratory, watching everything intently. Set into one wall was the synthetic sun radiation cabinet in which the final co-ordination of seven separate chemical operations was to be completed.

As he watched, Craster felt a grudging satisfaction. He would have quarrelled

instantly with anything that jarred his suspicious mind, but everything in Calvin's processes seemed convincing. There was no doubt about it; he was an ingenious devil—and an avaricious one.

Calvin moved with competent motions among his laboratory gear. He used test-tube and beaker with precision, handled a slim thermometer which lay in a thick glass globe the size of a golf ball. The glass globe was passed over an electric heater three times, slowly, and Calvin used a tiny sucker to extract a minute drop of fluid from the globe. Then his hands turned unerringly to another process. It was simple in appearance, yet Craster knew the complications behind all the chemical jugglery. From this operation, Calvin went on to check his vibrator needle.

An hour passed, in which not one word came from Calvin and Craster hardly moved, though his eyes followed the other man unceasingly. At last Calvin approached with a prepared hypodermic needle. The flash of his glasses hid the look in his eyes, but his thin mouth smiled.

"This nullifies nerve reaction. I must have central nerve control when using invert-plasia."

Craster thought harshly: "*This is the unknown. I have to trust him, but I'll kill the fool if he fails me. Unless I'm dead first . . .*"

But if he didn't get a new physical identity, the Law Officers would soon grab him. Craster held out his arm, pushed back his sleeve. Within thirty seconds he realised that certain nerve centres were stabilised. He felt for them expertly, pressed. He felt curiously emotionless, yet he could still use his reason.

Calvin had a chart, and according to this Craster was due for three chemical operations in the next five hours; then would follow a six-hour period of sleep. Then two more operations, all administered chemically, spaced at three-hour intervals. Then more sleep, followed by a spell inside the sun radiation cabinet; this had no predetermined timing, but would be carefully watched by Calvin. The two remaining chemical operations would be local injections and have a

purely glandular effect. Finally, Craster would re-enter the sun radiation cabinet and stay there while the extraordinary properties of Calvin's synthetic rays fused and co-ordinated the dwindling plasia, those multiple growths which gave Craster his bulk.

Craster was very obedient once embarked upon the strange project. Calvin administered to him punctiliously, his manner one of professional calm. He led him to his bed, a rather soiled couch. He gave him small meals of suitable food. And then, at the end of about thirty hours, he shepherded him to the sun radiation cabinet, a giant of six feet six inches—for not much longer.

Craster settled himself against the lead walls of his cell and refrained from looking at the white glow from the ceiling. There was no heat—just radiation. If there had been a fair ratio of heat to the intensity of illumination, he'd have frizzled in two seconds to less than vapour. As it was, he felt queer. It could have been a hangover—that was exactly how it felt, and he didn't relish eighteen hours of it. But there was no retreating now.

He wore one of the new electric watches that ran off the electricity in the body, but after an hour he saw that the pointers had stopped. To pass the time, he pulled the watch to pieces. The minute windings were a mere smear of soot. Craster laughed grimly, fumbled for a cigarette, and realised that Calvin had ordered him not to smoke.

He was never aware of passing out. He was unaware of any physical alteration. He did experience queer, alien pains where sensation had never seemed to exist before. He vomited. Coloured, nightmarish images swam before his eyes, and sometimes he was aware of Calvin peering through the observation panel in the cell door.

Then Craster descended into black unconsciousness; and though he did not know, he lay for a further six hours in the cell. Adrian Calvin spent those hours staring at him with a cold, fascinated sneer. He'd made many experiments, nearly all successful, with mice, frogs, and flies, even an elephant he'd bought from Brand City Zoo. But he'd never

before had a human being in his sun radiation cell.

Another enjoyable fact was that he hated Ralph Craster. He hated him simply because he was Craster, and it was pure satisfaction to watch him undergoing a horrible transformation. Craster was no fool, but in his desperation to avoid the law it had been easy to trick him. It had been simple, too, to recover his note-case from the big, lightning-scarred oak. Calvin laughed gently at his own ingenuity.

"Reduce me!" he repeated, mimicking the insolent manner of Craster. "Yes, we'll reduce you, Ralph. Then you can take your place among our pets . . . ."

RALPH CRASTER groaned. As he opened his eyes pain coincided with a battery of flashing white lights, and he closed them again. He lay still, grimly summoning energy to rise and recover his grip on reality. Somehow, he guessed the operation was over. If so, he was determined to master himself quickly. But physical recovery from shock takes time, and he had to wait while ghastly vomits shook him. Then the whirlpool ripples of pain ebbed, and he began to think clearly.

Eventually he sat up. He was not in the lead-walled sun radiation cell. He lay in the open, among what seemed to be a forest of coarse green reeds. He looked in vain for Calvin.

"Where am I?"

He was kneeling, panting like a floored boxer. But even so, his energy was returning. He tried to look over the top of the thick reeds. He got to his feet unsteadily, and only then could he see over the tangle of tall green stems.

Craster had a red, raw spirit with the anti-shock qualities of a railway buffer. But his heart gave a leap of stark fear when he looked across the waving sea of vegetation surrounding him. The reeds were grass! There was no doubt about it—and he could just see over the heads of the foot-high blades. What he saw beyond was all corroboration. There was a tree with a smooth, shiny trunk, and it seemed to tower sixty times higher than himself. Grimly forcing his

brain to estimate, he reckoned that it could be only ten times the height of an ordinary man . . . .

He clutched some of the strong grasses for support as, in a whisper, he cursed Adrian Calvin.

"The swine! He's tricked me. I'll—"

The futility of any threat he might make overwhelmed Craster, and he shook with rage. He glanced down at his clothes: he was wearing a pair of baggy trousers, a ridiculous jacket and a most uncomfortable pair of sandals. They were rough—the work of an amateur, and nothing like those he'd once worn. He supposed that the ancient Mrs. Johnson must have made them, hurriedly, on Calvin's instructions.

Craster thrust blindly through the grass. Luckily, only a few paces separated him from a flat, hard strip of ground which wound into a distant vista of trees towering like giant pillars. He realised that he was standing on a foot-path which was probably only a yard wide, though to him it was a roadway hedged with a tangle of tufted grass higher than his head. He moved cautiously along, stepping over corrugations and avoiding stones which were like boulders.

So this was Calvin's revenge for his insults of two years ago! He'd reduced him to a manikin. And Calvin was the only one who could possibly restore his stature—if he could be induced to do so. Obviously, threats would be useless. He would be challenging a giant six times his size . . . .

He found Calvin at the end of the path. He was not aware of him until he saw his great legs shooting up out of the grass. The morning sun on his glasses turned them into huge, scintillating shields as he smiled down at Craster.

"Calvin, you promised—to help—me!" Craster choked over the words. His voice sounded quite unlike his own.

"You fool! Get back in the grass, and speak up if you want me to hear you." Calvin poured his contempt down on him. "Have you met any other of my pets yet? I shall be interested to see how you react to them . . . ."

He laughed shortly. Then his voice

became hard. "You're enclosed in a strong wire-net compound, Craster. You can't escape, and even if you did you'd regret it. Here, you will at least have food. I shall put your meals out twice a day beside this fence. You will learn the times and you'd better be there, because there are many other inmates who are always hungry. It is quite an interesting situation, isn't it, Craster? How will a man with a stature of one foot fare among other animals which have been greatly increased in size?"

Craster shook a puny fist. "By Heaven, Calvin, I'll get you, if I have to kill myself to do it!"

"You have a squeaky voice," observed Calvin, and raised his foot. An immense shoe shoved Craster from the path and threw him flat among the grass. When he struggled up, cursing, Calvin was gone. He stood there breathing heavily for a moment, then stumbled away in confusion.

Two minutes later he was crossing the broad strip of hard ground when a huge, black insect fully a quarter his own size crawled out of the grass towards him. Immediately behind it came several others just as big. Craster recoiled, and ran to the other side of the path; it took him at least six rapid paces. He looked round. The insects were right behind him, travelling at a speed which seemed horrifyingly slow, though too fast for his liking. He recognised them as ants, but decided that to a normal human being they would appear as big as tortoises. Obviously, some of Calvin's "pets."

Craster began to run along the edge of the path, trying to outflank the ants. He succeeded only because they did not act as individuals. They crossed the path and disappeared into the grass on the other side. Craster was well down the path, then, and the ants did not deviate. Perhaps they were intent on some pre-set mission. He breathed with relief and slackened his pace.

He looked about for a hefty stick to carry, and to his delight found something infinitely better. He was close to the wire-net fence, and it seemed pretty sound, but nearby was a post which had at one time carried some wire for a boundary fence. Perhaps it had been

there before Calvin erected his wire-net compound. Anyway, a length of stiff steel wire still hung from the post.

Craster spent some time breaking off a piece of wire equivalent to his own height. He hammered with stones, then bent the wire backwards and forwards at the weakened spot. It seemed like an hour of agonising work before the fracture finally snapped. He straightened the wire by standing and jumping on it, then sought a rough stone to use as a grind-stone. It was a long job getting a point on the spear, but he was grimly aware that he might be thankful for the time spent. The ants might be the least of the terrors inside the compound. He had not forgotten Calvin's talk of his experiments with many different species.

HE WAS NOT unmolested while he worked. Once he was startled to see a huge animal lumbering through the grass. At least, it seemed huge to him until he realised that the animal was an elephant barely two feet in height. Instantly it struck him that this was the creature he had glimpsed in the wood as he was approaching Calvin's home, or another one of its kind that had somehow escaped captivity. Evidently it pleased Calvin to reduce large animals out of all proportion, and to magnify small creatures like ants and flies. A quaint sense of humour . . .

Eventually, he saw Calvin again, striding along at the other end of the compound. But Craster hid himself in the grass, well out of sight, until the tall figure moved away towards the house. It became clear that the compound was close to the rear of the mansion and extended for quite a distance in the other direction. Despite his journeyings back and forth, Craster found it impossible to estimate its area anything like accurately.

But when he came across the oil drum he instantly realised its value. Shelter—he needed that. The drum was just roomy enough for him, and although it looked dirty and lay half-hidden in a clump of nettles, it was well worth investigating. He swished at the nettles to clear a path to it and was about to move forward when, from the gaping



mouth of the drum, there leapt a frightening monster. It was grey-furred and had wicked claws and teeth. To Craster it seemed as big as a buffalo, yet he knew it was a rat little bigger than himself.

Even as it leapt he raised his spear and lunged for its red eyes. He was lucky. The weapon found a soft spot, though the momentum of the stenchy monster wrenched the spear out of his hands as it rushed past him. He hung back, panting, while the nettles tossed wildly as the rat died. When the movements ceased he cautiously approached to recover his spear.

"One less of your pets, Calvin!" he muttered grimly. And swore to himself, savagely, that if he could only survive among the rest of this fantastic menagerie Calvin would pay dearly for this cruel trick on him.

The oil drum was stinking, but that did not deter him. He decided to move it under a thick, leafy bush which grew some yards away, though those few yards were an appreciable distance to him. It was difficult to move at first, but he used his spear as a lever, straining to overcome its inertia. The four-gallon container rolled over, flattening the thick mattress of head-high grass and nettles; then it halted heavily and Craster swore, yet was thankful that it was made of aluminium. Had it been steel the task might have been beyond him.

Slowly the drum crushed a path

through the grass, and Craster sweated from his exertions. A swarm of flies—of normal size, untouched by Calvin's experiments—found him. They buzzed around his head, deafeningly, and he swung his hands to catch one. It was an ample handful. He crushed it with a blow of his spear, and turned back to the job of keeping the drum revolving.

Finally he got it under the bush, and after a brief rest he set about cleaning it out. Several times he stopped, swearing harshly at the filthy task. He used thick twigs and some flat, chipped stones to scrape out the dried oil and dirt, then went in search of water. There must be water somewhere.

Looming in the distance above the swaying sea of grass he could see the towering trees, and he decided to cut through the grass towards them. He thrust himself through the green tangle, cursing as strong stems hindered his progress. Then, suddenly, he blundered upon an obvious trail. The grass was crushed almost flat as though some heavy animal had been this way, and Craster halted, his mind dark with speculation. What kind of creature was it? Was it one of Calvin's grotesque specimens or a natural animal he had yet to experiment upon?

Discreetly, Craster retreated and made for the open path where he had more chance to see what might lay in wait for him and it was easier to flee from any menacing monster. He had just

emerged from the screen of grass when Calvin's colossal bulk bore down on him. His great shoes, with their gaping cracks, stopped within inches of him. His hand, like a huge crane-hook, dangled above his head. His voice reached down.

"Well, Ralph, how do you like your new environment? I'd be glad of your reactions, you know."

Craster's plea was a shrill piping in Calvin's ears.

"Bring me back to normal size, Adrian—please! I'll give you the rest of the money."

"Don't you worry! I've already got that. My fee, of course—"

"Then I'll get more for you—I swear I will!"

"I'm afraid I couldn't rely on you to come back if I let you go," drawled the giant, lugubriously. "Besides, you're hardly big enough to look after yourself in the great, wide world, are you, Ralph?"

"Wait till those Law Officers come! I'll make myself known to them, and you'll be punished for what you've done to me." In his growing frustration, Craster was resorting to threats.

"And give yourself away to them? You'll get what's coming to you, too," Calvin mocked. "No, I think I'll sell you," he went on slowly. "There are still showmen who buy freaks, even in this age of mechanical amusements. You'd be quite an attraction—"

Red rage gripped Craster, and he lunged swiftly at the immense trousered column rearing up before him. His spearpoint dug into soft flesh, and there was a loud roar of pain from above. The next moment he was lifted bodily off the ground by a leg like an excavator arm; but the realisation of its value to him, and his determination to retain it at all costs, prompted him to keep a tight grip on the spear even as he fell with it on to the grassy verge.

Half-stunned as he was, he scrambled to his feet and, bending low in the tall grass, pushed through the yielding blades as fast as he could, away from Calvin's feet. At any moment he expected one of those giant shoes to tread down upon him, or a huge hand to seize him in a grip he would be powerless

to escape. But apparently Calvin had had his fun; for when he stopped and turned to see if he was being pursued, Craster saw his head and shoulders retreating into the distance.

CRASTER WENT back to his oil drum. There was still an unpleasant smell about it, so he gathered a pile of twigs and heaped them up inside. He found some dry tinder and two pieces of flint, and began to rub them together, working away with dogged perseverance until at last a spark fell upon the tinder and he blew it into a flame.

The fire was an effective cleanser, though the metal held the heat until late in the afternoon. Then Craster made a bed of soft grass shoots in the cylinder and rested his weary body. He came out of a doze to realise that he was hungry, and remembered that Calvin had said there would be food. He got up and, taking his precious spear, made his way to the place he had indicated.

He found a great bowl of wet mash prepared from some sort of cereal, and began to eat with his fingers. His hunger was very real for all his smallness, and if the stuff was hardly appetising, at least he could eat his fill. The bowl was big enough for a bath, though it was the usual household utensil. Vaguely he wondered if his digestion could still cope with a synthetic steak, or would the fibres be too coarse? Perhaps an egg would be better. One egg, fried, would be an ample meal for him . . .

As he ate he looked up at the tall wire-net fence that hemmed him in, and suddenly it dawned on him that Calvin might have made a mistake. His next thought was cold and logical. That mistake would be fatal—for Calvin. He thought he had merely added another specimen to his menagerie, without realising the significance of the fact that it could think and was, therefore, more dangerous than a whole pack of giant rats or a colony of monster ants. He'd forgotten that Craster was still a human being, if a very diminutive one. He had, too, overlooked the fact that even a foot-high animal which was a product of monkey ancestry could climb a wire fence, be it fifteen times his height.



Especially when that thinking, reasoning, *hating* animal was as determined as Craster was to exact revenge.

Yes; he would kill Calvin—and here his very minuteness would be to his advantage. He *had* to kill Calvin if he was to regain his normal stature. While he lived, he would always be master and Craster could not hope to control him and his experiments. But if he and the Johnsons were out of the way, he would be free to work the sequence of glandular operations and the sun radiation treatment upon himself. Given the run of Calvin's laboratory, despite his puny size, he could study his processes and apply them to his present situation. There would be notes and data which he was fully qualified to understand, and any piece of apparatus too big and awkward for him to handle could be adapted to his requirements. It might take time, but there would be time enough before the Law Officers arrived.

His mind made up, Craster stole back to his improvised shelter to work out the details of his plan. If all went well, he wouldn't need the oil drum after that night. When dusk set in he was crouching close by the wire netting where it overlooked the old mansion, and his spearpoint had a needle sharpness. He could see the light in Calvin's study, shining through one of the windows in the rear of the gigantic pile.

Pushing his spear through the wire netting, he began to climb the fifteen-foot fence. It was a long, breath-taking ascent. The mesh provided a sure grip for his small hands and feet, but the loose netting bulged and swayed even under his slight weight and he was giddy before he reached the top. Here the net curved outwards and he had to hang by his hands before he could get a footing on the other side. The strain on his aching arms was terrific, and looking down, he was horrified at the drop. For a full-sized man, it would be like hanging from the top of a scaffolding a hundred feet high. If he fell . . .

But he came down the netting easily, and when he reached the ground he did not stop for long to recover his driving energy before he set off towards the house. He soon found what he wanted—

an open window which wasn't too far off the ground and where the rough wall surface offered ready holds between the stone bricks. Even so, scaling the wall to the window was difficult and exhausting. When at last he hauled himself on to the broad sill, he lay gasping for breath while his tiny heart hammered against his ribs.

He peered into the dim recesses of the vast room. There was still light enough for him to see that the door on the other side stood ajar, fortuitously. He observed thankfully, too, that the drop to the floor could be accomplished by easy stages. Just below the window-sill lay a small table-top from which he could reach the arm of a big chair, and then the seat, whence he might clamber down to the floor.

In a minute he was walking between the legs of an enormous table in the centre of the room, making straight for the door. He slipped through the opening into the silent, oak-panelled passage which, he realised after a moment's hesitation, led from the huge, disused kitchen. He did not want to go that way: the kitchen harboured rats. He began to run along the passage in the other direction, towards the great staircase which led to the first floor and Calvin's bedroom.

With a seven-inch stride, it was a considerable sprint. His only fear was that Calvin or one of the Johnsons might suddenly come this way, though the chances were not great, for none of them moved around the house much. Calvin kept mostly to his study or the laboratory, while the Johnsons hardly ever left the two ground-floor rooms where they ate and slept, after their day's chores.

THE STAIRS proved a difficult obstacle for Craster. He ascended them by grasping each uncarpeted ledge and hauling himself up. After twenty or more such gymnastic feats, he was forced to rest to get his breath back before he continued along the landing to Calvin's bedroom. The door was closed, and he retreated into a dark doorway on the other side of the hallway to wait. There was no way into the bedroom except by the door, and the handle was well out of

his reach. But Calvin would open it for him.

He waited for what must have been more than an hour before Calvin came slowly up the creaking stairs. As he opened the door, Craster crept out of his hiding place and slipped into the room behind him. The giant had not the slightest suspicion of his presence as he crouched in a corner beside an ancient wardrobe. The moon shone brilliantly through the uncurtained windows, and Calvin did not trouble to switch on the light, but undressed carelessly and got straight into a bed which was an untidy heap of blankets.

Craster waited until Calvin's snore filled the room. It was just an ordinary snore and not an amplified tumult; for sounds were no different to Craster's tiny ears, even though his voice had become a squeak with the reduction of his vocal cords. But it reverberated annoyingly, increasing his impatience to silence it.

The sleeping giant did not stir when Craster climbed up one of the legs of the bed and stepped cautiously over the soft blankets towards Calvin's head, his spear held ready. He mounted the pillow, gazed into the huge face. The prim fool! Even in sleep his pursed lips were an irritation.

With a spear as slim as a needle, there was only one way to kill him. Through the eye to the brain . . . Craster struck with all his strength, forcing the spear-point deep. After a tremendous, convulsive start, Calvin lay still, snoring no longer. Death had been instantaneous.

Craster scrambled agilely down to the floor. He found the slim cord of Calvin's dressing gown lying in a heap in the corner, and threw it high, looping it around the doorknob. He gave it another twist, then, keeping the left-hand cord tight with one hand, pulled hard on the other. The knob slowly turned and, stepping back quickly, Craster jerked the door partly open. Whipping off the cord, he trailed it after him as he slipped through the opening and along the passage. He would need it again . . .

He went down the staircase in a series of careful leaps, made his way swiftly to Calvin's laboratory, and was able to open

the door with the cord, pushing against it as he pulled on the knob. It took him some time before he managed to throw the cord over the electric light switch, but he finally succeeded in turning on the light. He noted with satisfaction that the blinds were still drawn, preventing the light from showing outside where the Johnsons might see it; though it was probable they were sound asleep in their remote bedroom.

A search of a convenient locker of chemicals, the doors of which were little more than his own height, revealed several near-poisons in tablet form. Recognising *hypothymel*, he selected two tablets. He found a sheet of paper on the untidy floor, grinned thinly as he ground the tablets into powder with a pestle that had dropped from a bench. The operation reminded him of an old-time labourer breaking stones . . .

A taste of *hypothymel* was sufficient to induce deep sleep, and a full dose all the sickening symptoms of near-poisoning. He intended to administer the drug to the ancient Johnsons so that they would be out of the way while he went through Calvin's laboratory processes. Perhaps he could kill them just as easily, but he did not hate them as he had hated Calvin and it seemed too callous—he had enough on his conscience already. And if he did happen to get caught . . .

He got into the Johnsons' living room by expert work with his cord. He blessed the fact that the blinds were not drawn and that the moonlight shining through the windows made it unnecessary to switch on the light—a laborious and dangerous procedure for him, with the Johnsons sleeping next door. He climbed a chair-leg and hauled himself to the table, whose top bore obvious signs of their last meal before retiring—and of Mrs. Johnson's dilatory housekeeping methods. There was a bowl of sugar, a jug of milk, and several unwashed plates and dishes.

He emptied most of the paper packet of ground *hypothymel* into the sugar bowl, and mixed it up with a teaspoon. Just to make sure, he tipped the rest into the milk. It was pretty certain that the old pair would make a cup of tea first thing in the morning. They would probably



take one up to Calvin, but it would not revive him. He hoped the drug would work on them before they had a chance to discover him. In any case, they would be lying as still as he before they could give the alarm.

HIS PRECAUTIONS complete, Craster went back to the laboratory to make an immediate start on Calvin's processes. If only he could emerge from them still differing from his official physical coding, he might escape the penalty for his crimes when he resumed his place in the normal-sized world. He'd never miss that foot now!

The laboratory gave direct access to Calvin's study, next to the big room where he performed the miracles he conceived and planned in the smaller one which housed all his secrets. Eagerly Craster clambered upon the chair before the great desk, heaved open the drawer and stepped inside.

The litter of notebooks and papers took him all night to sort and examine. It was heavy, exhausting work moving and

scanning books almost as big as himself. After turning a page he had to get well away from the propped-up book in order to read it in anything like comfort, and squatting on the hard desk-top was hardly comfortable, even with his back against the side. But he never stopped in his efforts, amassing smaller pages of essential data for his own reference with a broken piece of lead from a propelling pencil.

When morning dawned, he thought he had thoroughly absorbed the whole sequence of chemical operations as far as his practical requirements were concerned; he had skipped most of the theoretical and observational details which Calvin had jotted down. He felt he knew enough about the synthetic sun radiations to manage that part of the process, too. The chemical part would be the most difficult, but it was not beyond him now.

Craster's confidence surged anew. He'd beaten Calvin, and when he'd regained his real stature—or most of it—he'd ransack the place and recover his money. Another forty-eight hours should see his rehabilitation complete, with time enough to get away before the Law Officers caught up with him.

Returning to the laboratory, he spent nearly two hours preparing the fluid which nullified nerve reaction, which he finally administered to himself with a minute hypodermic. He was glad the lab. was so well equipped; there were many sizes in its appurtenances, and he was able to work with beakers and test-tubes which, though large for his purposes, were in fair proportion to his height. The process on which he had embarked was chemically in opposition to that which had reduced him so drastically. This time, he had to obtain hyper-plasia—a controlled build-up of the multiple cells which gave him his bulk.

Carefully, then, he laid his plans for the manipulation of the sun radiation cabinet during his spells inside. It would be simple enough. There was no need to lock the door for his first immersion in the rays, and he would simply walk out of the cabinet after the calculated period. For the second

immersion he hooked up a time switch he found in the laboratory, so that even if he passed out the radiations would be cut off at the end of eighteen hours.

The mechanics of the wires, clips and nuts presented no real problem to the midget Craster. But the operation of the big disc vernier controlling the sun radiation generator called for all his strength. First he had to pull a little, four-step ladder up to the panel, using some of Calvin's biggest instruments as levers. Then he was able to reach and turn the vernier by hanging on to the operating handle with all his weight.

Curious, he examined the generator. The extraordinary machine was a little beyond him, until he sought and found some more of Calvin's notes which he had overlooked before. Apparently he had discovered that ultra-violet rays could be broken down into three basic elements, one of which was pure, heatless solar radiation. Evidently these heatless rays were the secret ingredient which enabled all living matter on Earth to thrive and grow. So Calvin had built this squat mass of prosaic windings which, in conjunction with the Seeley light tubes in the ceiling of the cabinet, produced synthetic sun radiation minus heat.

Craster found the notes jumbled, but it seemed that the pure sun radiation was the one vital spark needed to complete the cellular alterations resulting from Calvin's chemical processes.

It was while he was unearthing these notes that Craster encountered his first setback in his duplication of Calvin's experiments. It could hardly have been a worse time for him to find the extra scribbled pages; for with the nerve nullifier coursing through his veins he was inclined to dismiss any warning of disaster that stirred in his brain. The injection from the tiny hypodermic had killed all fear of the consequences of any error he might make from an insufficient appreciation of Calvin's gropings towards success.

With complete lack of emotion he read that Calvin had met with several failures in the course of his experiments, though he seemed reluctant to make much of them. Some creatures had

died, and always for the same reason—unsynchronised internal organs. The notes ended with a few triumphant sentences: he had finally solved even this problem. But in the elation of his complete success, Calvin had neglected to write down even the slightest clue to the modifications which were necessary to avoid failure in this respect.

Coldly, feeling no anxiety while realising his danger, Craster searched through the untidy bundles of papers again and again. In the end he gave up, decided to proceed with the first of the glandular operations. Time was not on his side. He took a mild, drug-soothed acid which had the function of preparing his tissues. Presently he made the second injection, and then the third.

By this time he was thoroughly tired. He'd had no sleep at all that night. But the spaced local injections of the third operation were due to be followed by six hours of sleep, so at length he lay down thankfully.

HE AWOKE to find dusk glooming the laboratory, and pulled the string he had attached to the electric light switch. He did not trouble to draw the blinds. There had been no slightest sound in the big house all day, and the old Johnsons would still be in their drugged sleep. He studied his notes as he lay on the soiled couch on which Calvin had been wont to rest himself between his labours. He was due for the next two operations, which had to be exactly separated by three hours. He had the drugs ready in the diminutive beakers and hypodermics.

The night passed with tense slowness for Craster. He was glad to sleep at the end of the sequence of chemical infusions, willing himself to waken after so many hours. Then followed his first spell in the synthetic sun radiations. When he thought he had had enough of the heatless rays, he walked out of the cabinet to undergo the two remaining glandular operations.

As he carefully cleansed his minute hypodermics and filled them with the new injections, he could not help but feel a little grim, thinking of those last notes of Calvin's concerning the secret of synchronising his subjects' internal

organs. He wondered how many animals in his weird zoo had died; he had evidently been careful to remove their carcasses, at least those of the monsters. But there was no hammering of Craster's heart as he reflected on his own possible fate. He was still perfectly cool, though he could not make up his mind whether it was due to his natural calm or the result of the nerve nullifier, whose effects were supposed to last throughout the operations.

Craster went back, eventually, into the sun radiation cabinet, for the last time a manikin of twelve inches—he hoped. He had set the time switch to cut out the generator in exactly eighteen hours. He crouched in a corner of the cell, staring blankly at the door. He did not want to sleep, and he hoped he would not lapse into unconsciousness. He longed for a cigarette, until he remembered that he must not smoke and that, anyway, there was no cigarette small enough for him. He would have to wait until he was his normal size again.

Finally, he did pass into dark oblivion. There were all the sickening, nightmarish sensations he had felt during the first operation. Then black night . . .

When he came round again, his head dizzily uncontrollable, he was yet able to appreciate the enormous acceleration of the hyper-plasia. The build-up of cellular growth had been sufficient to burst his midget's clothing, and the pieces of cloth fell from him as he willed himself to stand. Staggering towards the door, he noticed that the radiation had cut off and that it was still light outside. But there was much more that he noticed, and that brought a great surge of fear.

Vaguely, at first, he wondered why he could not stand upright, though he mustered all his strength. Then gradually he realised that he had to bend his head and shoulders because the ceiling of the cell was so low. He pushed open the door to pass through it, found that the door-post was well below his chin. He started to laugh harshly as full realisation came. Then, unaccountably, he had to stop laughing to regain his breath.

He couldn't understand why he was

gasping, but he knew what had happened to him. Judging by the size of the sun radiation cabinet, he was now about nine feet tall. He bowed his huge head and shoulders and, lurching drunkenly, went out through the door. Outside in the laboratory, there was more room to stretch himself—and more evidence to corroborate his new stature.

He stared at the reflection of his great, nude figure in a window, and wondered savagely where he had gone wrong. Had he spent too long in the heatless rays, or had he slipped up in his compounding of Calvin's chemical infusions? The latter seemed most likely, though he could swear he had followed out the processes correctly and that his own calculations weren't at fault. But the figures in Calvin's notebooks—they may not have checked with his final results. Something of the sort had occurred to him when he was hunting for those missing notes on the synchronisation of internal organs: that might not have been Calvin's only line of error. But he had been too apathetic of danger to let the thought disturb him or divert him from the course on which he'd started.

In a sudden, murderous rage, Craster stamped off to find clothes. He strode swiftly along the corridor, heading for Calvin's bedroom, but had hardly reached the foot of the stairs when he began to gasp painfully for breath. Mounting them, two at a time, he was almost choking. He had to stop and gulp at the air, then proceed more slowly. But he had the curious feeling that he was unable to draw as much air into his lungs as he needed. A strange, stifling feeling . . .

He arrived at the door of Calvin's room still gasping and puffing. It seemed the slightest exertion was too much for his lungs, that his great body needed more air—

With a terrible shock the truth dawned in his brain, causing his soul to cringe in terror. Unsynchronised internal organs—that was the trouble. His lungs were inadequate for his huge body. They were the lungs of a normal man, and his body that of a giant. The effort of carrying his massive frame up the stairs at the double was equivalent to that of a

man of ordinary size who had run a hundred yards, and it was more than his lungs . . .

CRASTER DIDN'T stop to work it all out. He had to get away, to make the best of his new body, before the Law Officers got on the track of the six-foot Craster—and found Calvin's corpse on the bed. He tried to get into some of his clothes, but they were ridiculously small. He went downstairs again to see if old Johnson's wardrobe could offer anything better—and walked into another shock.

Old Johnson was not in either of the back rooms. His wife was there, lolling over the living-room table where she was seated, still in a deep sleep; but the old man was missing. Looking for evidence, Craster concluded that for some reason he had not shared the tea which his wife had obviously made and drunk soon after rising the day before. Unless he drank it without milk or sugar? At any rate, he had escaped Craster's trap. And he had gone—where?

Craster felt sure he knew. Old Johnson must have found Calvin's body and set off for the nearest town as fast as his ancient legs would carry him. There was no telephone and no regular transport service, but once he reached the great motorway he would probably have begged a lift or found someone to carry his message. It was surprising that he had not got back before now. Perhaps he had met with an accident. Perhaps . . .

Whatever had happened, Craster had to move quickly. He had no chance of fooling the Law Officers if they caught him here, even if he was a different individual from the old Ralph Craster. He went back to Calvin's bedroom, searched until he found his notecase with its files of notes intact. Then he forced on some of Calvin's clothes and a pair of Johnson's big boots, cutting them until they fitted. He loaded himself with food and a small automatic pistol he had found in Calvin's study, and with intense bitter feelings, he left the old house.

He had not under-estimated the difficulties of a giant handicapped by diminutive lungs. Before he had gone

fifty yards he was gasping like a man who has just run five hundred. As he climbed a slope leading into the darkling wood he literally came to a standstill, gulping and choking with his inadequate breathing mechanism. And then, only a few seconds after he had penetrated the gloom of the protecting trees, he knew that pursuers were on his trail. The Law Officers must have arrived just as he was leaving the house. Their man-detecting apparatus, a scientific bloodhound, would have indicated his presence within its range, showed them the path of his flight. Above the sound of his laboured breathing, he could hear the noise of their hurried progress through the wood.

In his palpitating heart, Craster knew that he was doomed. But his dogged spirit sent him on, struggling against the choking frustration of his disproportionate lungs. Fifteen yards was his limit, and then he had to stop while painfully they laboured to provide enough oxygen for his bulky frame. Then he set off once more, a grotesque giant stumbling through the tall, calm trees.

He knew that he had been seen when a weapon cracked suddenly, though the shot did not come his way. An ironic thought flashed through his mind. Diminution had its compensations: if he had remained a manikin it would have been easy to elude the Law Officers. A moment later he saw the three of them advancing through the trees only about ten yards away, and he stopped to aim savagely with his automatic pistol, squirting a stream of lethal pellets at the blue-clothed figures. But they only came on towards him.

"Protectors!" gasped Craster. "They're wearing protectors."

He turned to run. He lumbered five, ten, twelve yards, at the best pace he could manage, then clutched at a tree-trunk as he gulped shudderingly for air. While his tiny lungs still strained at their hopeless task and his heart threatened to burst, the Law Officers overtook him. They closed in around him.

"You're Ralph Craster, and you're wanted for illegal surgery and the murder of Adrian Calvin."

"I'm — not — Craster — " he lied desperately.

"Yes, you are," said the Officer, looking up at him with a faint smile. "You've been experimenting on yourself. We know all about it from Calvin's servant, so you've no physical defence. And you should have made sure of Johnson's habits before you tried to drug him. He drinks nothing but water. He went out into his garden before breakfast, as he usually does, and returned to find his wife drugged. Then he went up to Calvin's bedroom. It was a long time before he got over the double shock, but even if we hadn't got here in time to prevent your escape we would have run you down eventually."

Craster knew he should have poisoned the old man. He might have got away with it then. But he still had one defence.

"I killed Calvin for my own protection. He used me as a subject for his experiments. I can prove I was victimised—"

"Perhaps. But you're still wanted for illegal surgery," the Law Officer said calmly. "The man whose brain you operated on will be an idiot all his life, and you know that a memory operation is illegal and will earn you capital punishment. You might as well tell us what you did with your patient's

money when you took it from his secret hide-out."

Craster hesitated. His breathing was easier now. Still his determined spirit revolted against defeat. Suddenly he flung himself upon the Law Officers as they stood together looking up at him. With his weight, a single well-placed blow should be sufficient for each man.

Furiously he struggled to beat them down, one by one, before they could guard themselves against his attack and draw their weapons. The one who had questioned him caught a blow from the giant's fist that felled him instantly, while another doubled up from a terrific slam in the pit of the stomach. The third, quick-witted and discreet, dodged round the tree. Roaring his rage, Craster plunged after him to strike him down before he had time to turn and challenge him with his pistol.

The Officer ran, moving swiftly between the trees, and Craster ran after him with great, long-legged strides. But his lungs, already overtaxed by his strenuous exertions, could not meet his racing body's demands for air. Within fifteen yards he fell cursing, gasping and choking. A moment later, his limbs lost all of their useless strength beneath the tingling ray from a paralysing pistol, held by a blue-clothed figure which came towards him through the trees.

THE END.

---

**P. E. CLEATOR** is a name that is familiar to many readers of *FANTASY*. Author of the book, "*Rockets Through Space*," he pioneered the idea of rocket-flight in Britain long before the war. Besides being an expert on astronautics, he also writes science fiction. He'll be among the contributors to our next issue with "*THE BARRIER*," in which he suggests that the technical problems involved in a voyage to the Moon may not be the only difficulties in the way of our getting there.

# Matters of Fact—continued from page 1

are reputedly suspicious of anything "far-fetched"—or *were*, until the war made many hitherto fanciful ideas only too startlingly real—may have had something to do with the reluctance of editors to give their readers anything too highly imaginative. This in spite of the undoubted popularity of stories emanating from America in the tradition of the famous scientific romances of our own Mr. Wells. . .

Whatever the reason, it is no belittlement of their reputations as skilled English exponents of science-fantasy to say that John Russell Fearn and Eric Frank Russell, with others whose work we shall present in *FANTASY*, are better known to the magazine readers of America than our own. Both Fearn and Russell have lately gained recognition in their own land as authors of novels of fantastic theme which were published during the war. But they were well in the forefront of the popular fiction field of America long before the war—and they are still.

Fearn has been writing science fiction since 1931. Ninety per cent of it, comprising several million words, has been published in U.S. magazines. Twelve years ago he rocketed to the top as a producer of stories remarkably original in idea, since when he has been one of the most prolific writers of science-fantasy on either side of the Atlantic. Though preceded by a few short stories in this vein in various British periodicals, it was his novels, "The Intelligence Gigantic" and "The Golden Amazon," that made his reputation at home, where he has also established himself under another name as a writer of detective fiction.

At 40, he is more productive than ever; ideas come to him in such quick succession that only his tremendous zest for work enables him to keep pace with them. He wrote "The Last Conflict" specially for *FANTASY*, and is working on another novelette for us at the moment.

IT WAS MUCH the same with Eric Frank Russell, whose amazing book, "Sinister Barrier," marked his first real success in this country after earning him many American tributes and dollars. The magazine *Pic* said of it, when it appeared there in 1939, that it would go down in history beside the works of Wells and Verne as "the greatest imaginative novel of two decades." This was two years after he'd made his debut in transatlantic magazines

as a science fiction writer of uncommon facility and vastly refreshing style.

Some of his short stories and not a few articles on things strange but true have seen publication at home. But meeting the demands of American readers for his clever conceptions and racy humour kept Russell pretty well tied to his typewriter until he joined the R.A.F. in the early days of the war—after which he contrived to keep up a steady flow of material in a beautiful longhand.

Thus he produced "Relic," the feature novelette for our second issue. He wrote it while cooped up in camp overseas, and it was such a perfect piece of penmanship we decided it would be something like sacrilege to get it typed. The beauty of the manuscript will be denied all but the printer, but the ingenious notion behind the story and the sheer interest it holds will be yours with the next issue.

A lean, lanky Liverpolitan, Russell writes very much as he talks, in a forceful, facetious style that brooks no interruption. We'd advise you to make certain of that second issue right away.

NOW AND AGAIN we shall feature in *FANTASY* the work of some of the best of America's many science fiction writers. In an early number we shall introduce Stanton A. Coblentz, who has done a full-length novelette for us. We have also secured other stories by Ross Rocklynne and Lloyd Arthur Eshbach, whose names will be familiar to many readers.

Meanwhile, we take a certain pride in presenting for the first time in this country some of the work of the late Stanley G. Weinbaum, the young Milwaukee writer whose stories have been praised by the critics as little masterpieces of their kind. On his first appearance in print in 1934, he was instantly hailed as a genius who had brought to science-fantasy an entirely novel touch, leading the way to new heights of creativeness in this sphere. Like many of his fellows, he had a vast enthusiasm for this kind of fiction; and although his smooth, sincere style was a model which had many imitators, Weinbaum remained unexcelled until his promising career was curtailed by his death within two years.

Combined with his flair for making even the most fantastic creatures of his imagination live in surroundings none the less realistic for being utterly alien were an



inimitable humour and human interest that made his tales irresistible. Many of his admirers, among them John Beynon, the British science fiction author, believed he would make a name for himself comparable with the masters of imaginative literature, as

he might well have done had he lived. Years after his death, his writings are still being published in America, and we bring them to our readers certain that they will enjoy them as much as millions of others have done.

## Book Review

DAWN OF THE SPACE AGE, by Harry Harper. (Sampson Low : 8/6)

FOR YEARS before the war, any scientist who experimented with rockets was regarded as having a bee in his bonnet, and those who boldly proclaimed that their aim was to send a rocket into outer space became the butt of ridicule or were condemned as sensation-mongers. Two years ago, the prophecies of such pioneers that long-range rockets would be potent weapons in the next war were fulfilled only too dramatically. Now our politicians paint horrific pictures of a world struggle, to be avoided at all costs, in which rockets will convey atom bombs halfway round the globe in a few seconds, with results that will make Hiroshima look like a minor earthquake.

At the same time, American Air Force technicians are sending rockets into the stratosphere to greater heights than the airplane can ever reach, bearing instruments that bring back data on temperatures and pressures at high altitudes, and the effects of cosmic rays. One such meteorological rocket (a development that was foreseen thirty years ago by the late Dr. R. H. Goddard, whose rocket researches were financed by the Smithsonian Institution), is reported to have soared to a height of 104 miles.

This is by no means the limit to the rocket's peculiar capacity to penetrate the airless regions above the atmosphere—where, in fact, it functions best. Within a few years the U.S. experimenters hope to send a rocket to the Moon which will send back ultra-short wave signals indicating temperature conditions on that little world a quarter-million miles away. By that time they should also have developed a rocket capable of carrying men far beyond the atmosphere and returning them safely to earth. And anything from ten to thirty years from now, we may reasonably expect to see a giant rocket-vessel taking men all the way to the Moon—the first explorers

of interplanetary space, intent on the conquest of other worlds.

Fantastic? Impossible? The sceptics have been saying that since the first of the rocket-travel visionaries suggested it might be possible, in the days when it was just as hard to believe that men would fly through the skies in machines heavier than air.

Mr. Harry Harper, who has chronicled the evolution of the airplane throughout, has kept his mind alert to the extension of man's exploratory instincts to realms far removed from Earth. He is now an ardent supporter of the British Interplanetary Society, which has championed the idea of space-flight since 1933 and has given its blessing to this popular exposition of the whole subject of astronautics, which even a child could understand.

In simple, non-technical language, it tells the whole story of the rocket's development as a weapon from the Chinese fire-arrow to the German V2, of the application of its vast propulsive powers to various forms of transport in the days of rocket mails and rocket cars, and of its true potentialities for the future navigation of spaceships to the Moon, Venus and Mars. Especially now that atomic energy looms on the horizon as a driving force millions of times more powerful than is available from chemical fuels.

The author draws on the already considerable library of astronautics to trace the source of all its aspirations, from the first trip to the Moon to the creation of artificial planets to aid the establishment of man's extra-terrestrial dominions and the colonisation of worlds that have lured him for centuries. All of which notions, though "fantastic" enough, have inspired almost as many highly technical writings as they have science fiction stories. In fact, the history of their serious consideration as practical propositions is every bit as fascinating as any interplanetary romance.

# EARN MONEY from YOUR PEN

either as a full-time or spare-time writer. You can do this by linking up with the Author of the most successful book on Article Writing yet published.

My GUIDE TO ARTICLE WRITING has now been printed six times—a record for a book of this kind—and readers and reviewers alike describe it as the best on the subject yet written. I will gladly send you a copy on 7 days' approval. If you like it, remit 6s. 6d. to cover cost and postage; if you think it useless, return it. Based on the GUIDE I am running a Course in Article Writing which is proving a remarkable success.

A member has just written: *This is to give you the good news that the "Daily Mirror" published my article and are paying me eight guineas for it. This for a 500-word article seems to leave no room for grouching. Also "Daily Dispatch" have just accepted "Scarce as a Donkey."*

Full particulars, together with hundreds of other testimonials, gladly sent on request.

**G. J. MATSON**  
**ST. IVES, HUNTINGDON**

F.I.

"Truth is stranger than Fantasy"

## SCIENCE TO-DAY

will give you

### WEEKLY

readable, up-to-date  
concise, accurate, and  
at the same time exciting

## NEWS ABOUT SCIENCE

Subscription rates:— 30s. a year  
(50 issues) or 15s. 6d. for six  
months (25 issues) post free

Inquiries should be addressed to  
THE EDITOR, "SCIENCE TO-DAY"  
104, CLIFTON HILL, LONDON, N.W.8.

Tel : Maida Vale 5779

*To all Lovers of Imaginative Literature*

TWO ENTIRELY NEW BOOKS BY  
**ALFRED GORDON BENNETT**  
(The Author who "out-Wellies Wells, outdoes Jules Verne, and puts Rider Haggard to shame.")

## WHOM THE GODS DESTROY

A Novel of Oriental Mystery and Terror  
(Now Ready)

**THE COIL**  
AND OTHER STRANGE STORIES  
Weird, horrifying tales of the Supernatural  
(Ready Early 1947)

**BOTH 2s. net.** With Pictorial Jackets  
(Postage 4d. per copy)

Write for complete Catalogue of PHAROS publications

PHAROS BOOKS may be ordered through any  
Bookseller or direct from the Publishers

*Pharos Books Limited*  
COLWYN BAY : NORTH WALES

## Are You Interested

in the unusual? Do curious facts,  
experiences and mysteries intrigue you?  
Do you like strange stories, fantasies,  
futuristic and scientific fiction?

If so, you'll enjoy **OUTLANDS**—  
magazine for Adventurous Minds.  
It's provocative, challenging and unusual.

1/6 copy, or 6/- yearly (4 issues) post free from  
**OUTLANDS PUBLICATIONS**  
Dept. F, 19, Richmond Avenue, Liverpool, 21  
or some bookstalls.

## WANTED YOUR REACTIONS TO FANTASY

**DON'T FORGET TO  
WRITE TO THE EDITOR**

*Understand the Atom!!*

## **THE MID-TWENTIETH CENTURY ATOM**

by **MARTIN DAVIDSON, D.Sc., F.R.A.S.**

A sound, readable account of the modern conceptions of the atom, how they led to the atomic bombs and to the possibilities of industrial atomic energy. - - *Illustrated 8/6*

## **FROM ATOMS TO STARS** (2nd. Edt.)

by **MARTIN DAVIDSON, D.Sc. F.R.A.S.**

An important new book on the popular subject of atomic physics and astronomy. Written primarily for the amateur scientist and the intelligent layman. "The book is up-to-date and can be strongly recommended", writes Sir H. Spencer-Jones (Astronomer Royal) 15/-

**HUTCHINSON'S SCIENTIFIC & TECHNICAL PUBLICATIONS**  
*47, Prince's Gate, Kensington, S.W.7.*

# **Inferiority Complex**

An inferiority complex is a disturbance in the sub-conscious mind which manifests itself in self-consciousness, lack of confidence, nervousness, depression, worry, weak will and habits, lack of enterprise, stammering, blushing, forgetfulness, sleeplessness, etc. These are symptoms of "something wrong" within your personality which you can put right — a "disturbance centre" in sub-consciousness which sends out *powerful negative impulses overcoming and paralysing your positive impulses*, denying you the pleasures of achievement and the

joys of living. *You cannot control these impulses but you can remove them* altogether by eradicating from your sub-conscious mind the trouble from which they spring. This you can do yourself, in your own home, in your own time. Send postcard to-day for free copy of little book which fully expounds the wonderful discoveries of modern psychology and how you can apply them to yourself to achieve a fuller, richer, happier, and more successful life.

Write to-day for  
**FREE BOOK**

**BRITISH INSTITUTE OF PRACTICAL PSYCHOLOGY**

1, (M.S.4) LUDGATE HILL, LONDON, E.C.4.

# AMBITIOUS ENGINEERS



## HAVE YOU HAD YOUR COPY OF 'ENGINEERING OPPORTUNITIES'?

Whatever your age or experience—whether you are one of the "old school," or a newcomer to Engineering anxious to hold your position under post-war conditions—you must read this highly informative guide to the best-paid Engineering posts.

The Handbook contains, among other intensely interesting matter, particulars of B.Sc., A.M.I.C.E., A.M.I.Mech.E., A.M.I.E.E., A.M.I.A.E., A.M.I.P.E., A.M.Brit.I.R.E., CITY AND GUILDS, CIVIL SERVICE and other important Engineering Examinations; outlines courses in all branches of CIVIL, MECHANICAL, ELECTRICAL, AUTOMOBILE, RADIO, TELEVISION, AERONAUTICAL and PRODUCTION ENGINEERING, DRAUGHTSMANSHIP, GOVERNMENT EMPLOYMENT, BUILDING and PLASTICS (the great peace-time careers), MATRICULATION, etc., and explains the unique advantages of our Employment Department.

WE DEFINITELY GUARANTEE  
**"NO PASS—NO FEE"**

If you are earning less than £10 a week, you cannot afford to miss reading "ENGINEERING OPPORTUNITIES"; it tells you everything you want to know to *secure your future* and describes many chances you are now missing. In your own interests we advise you to write for your copy of this enlightening guide to well-paid posts NOW—FREE.

**BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY**

923, SHAKESPEARE HOUSE, 17, 18 & 19 STRATFORD PLACE, LONDON, W.1.

**THE B.I.E.T. IS THE LEADING INSTITUTE OF ITS KIND IN THE WORLD**